NEW ZEALAND Coal

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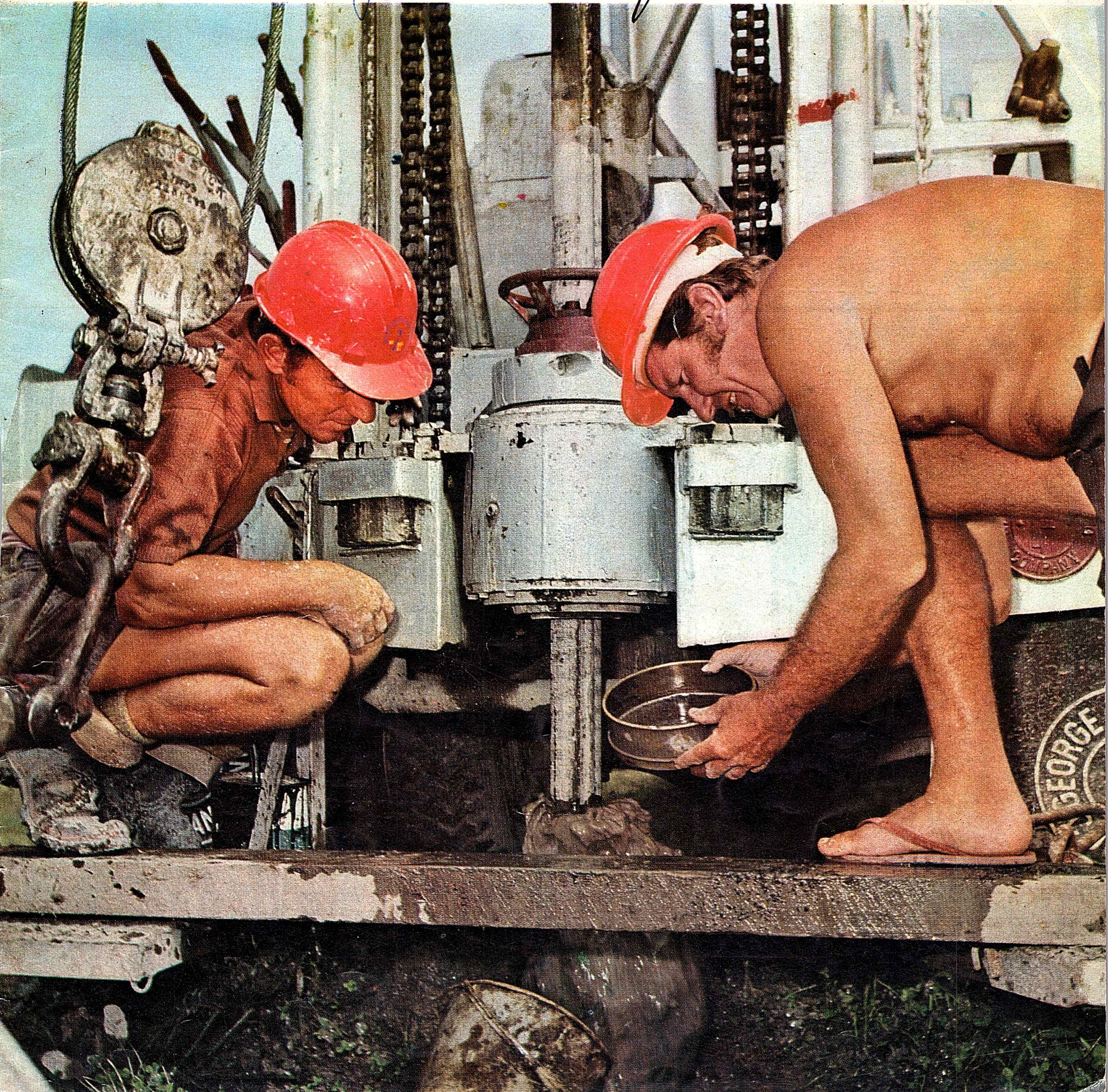

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NEW ZEALAND COAL

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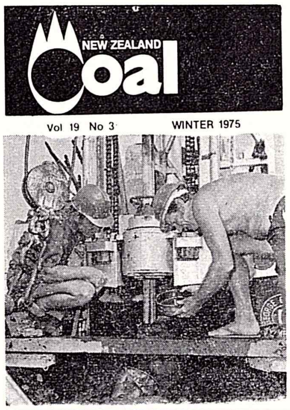

OUR COVER PICTURE

Highly successful results from the drilling programme in the Waikato have proved enough coal to supply a coal-fired power station until the year 2030 at a 50 per cent extraction rate. More than 300 boreholes, averaging more than 300 metres in depth have been drilled, proving that Huntly has 120 million tonnes of sub-bituminous coal — and the drillers have not yet stopped finding coal as they follow the seams north towards Auckland.

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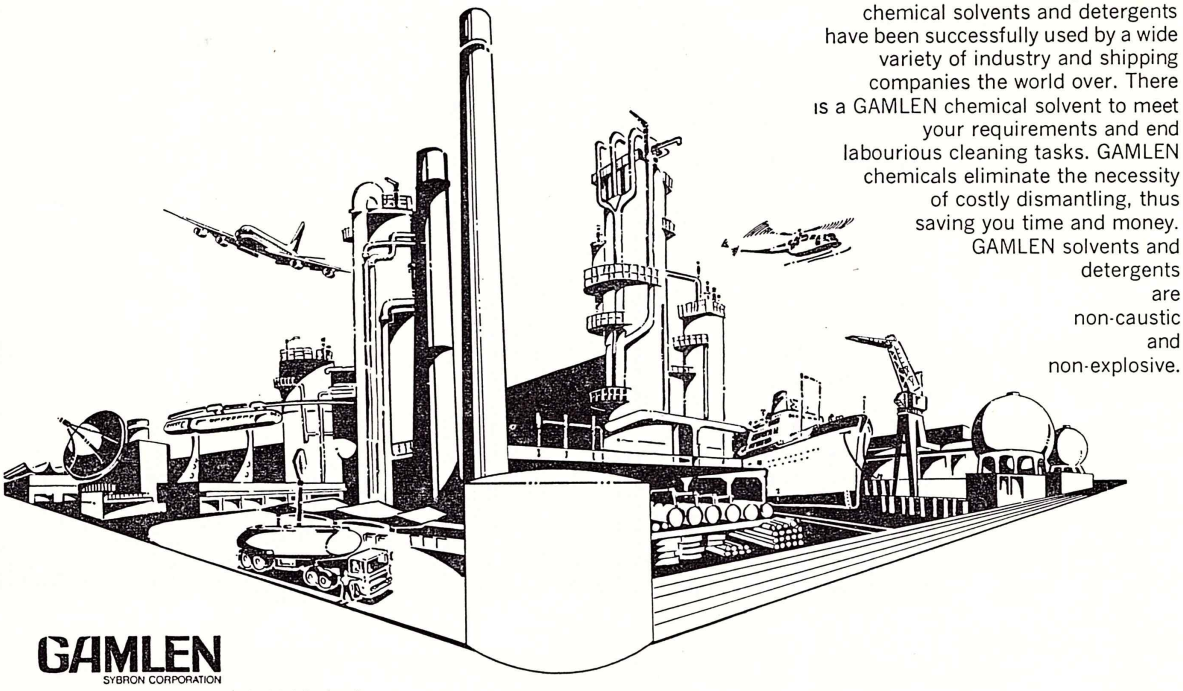

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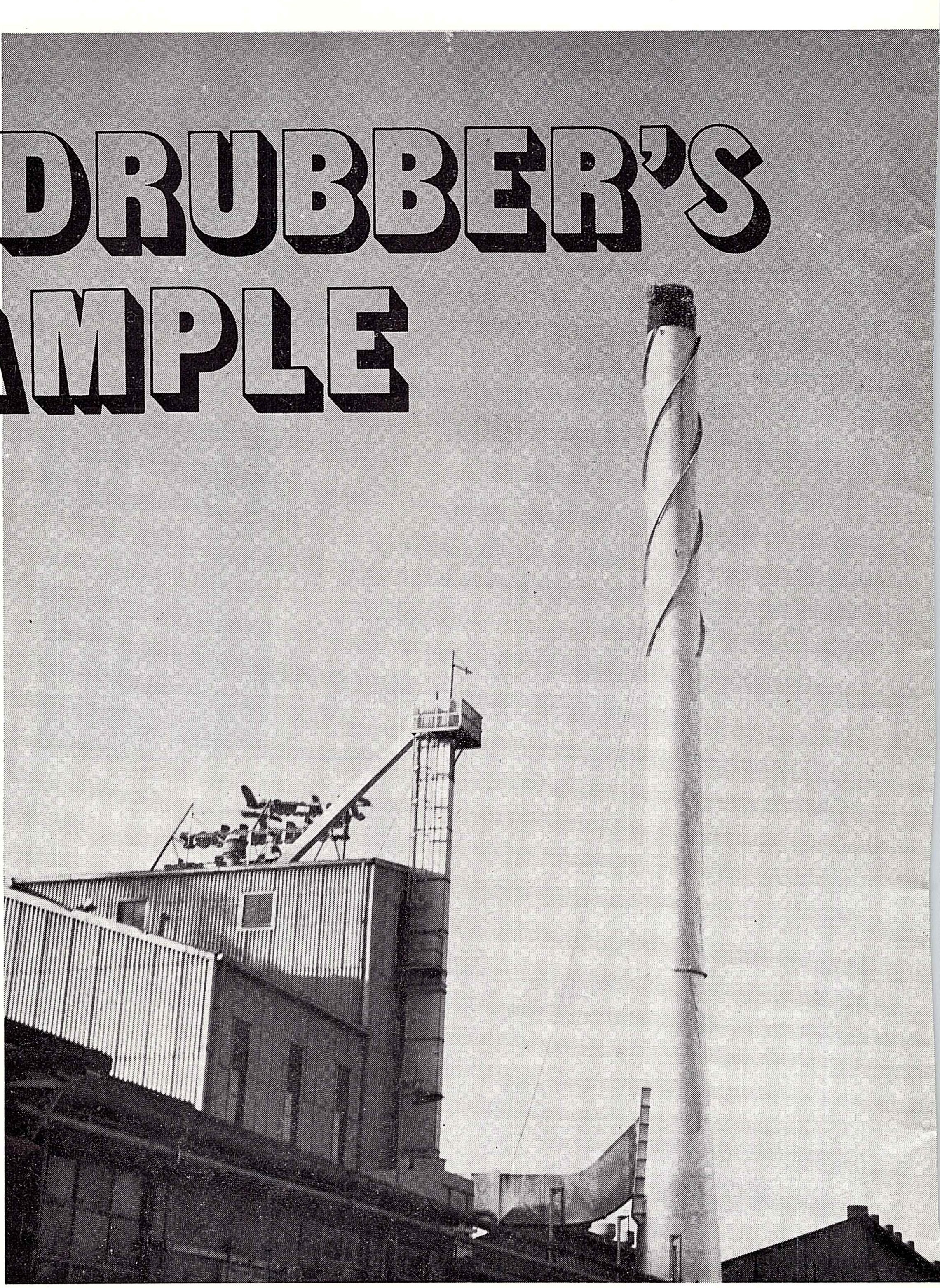
REIDRUBBER'S EXAMPLE



Coal elevator and stack at Reidrubber, Auckland. About 10,000 tonnes of Kopuku coal are used annually.

AUCKLAND STEAM PRODUCER SAVES NEED FOR NEW BOILER BY RE-ENGINEERING STEAM DISTRIBUTION AND USE, AND COMBUSTION CONTROL.

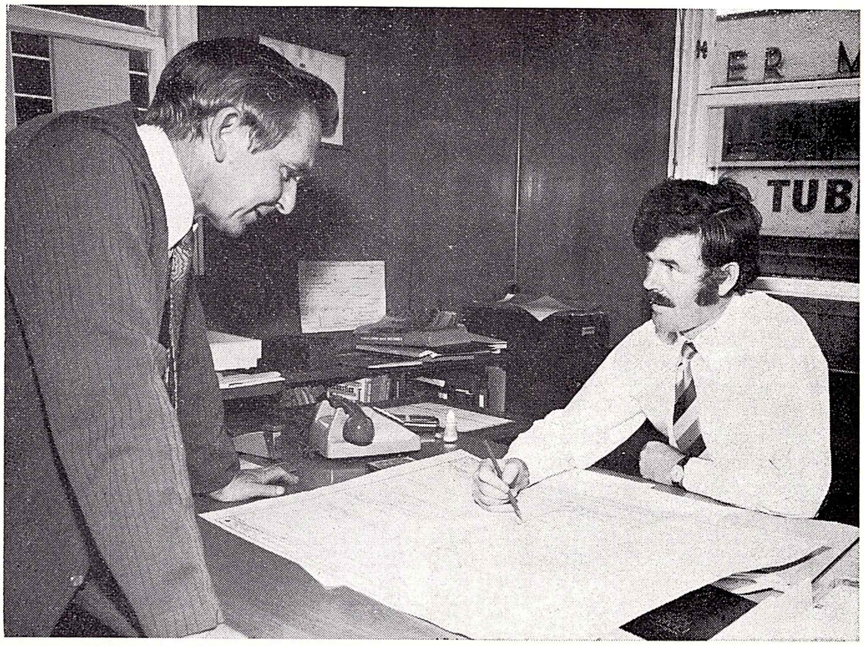
"If companies would only look at the great amounts of fuel they could save for relatively little money, spent on efficient automation controls," says Mr Val Goble, Senior Instrument and Services Engineer of Reidrubber Ltd of Auckland.

Reidrubber Ltd was contemplating buying another boiler last year to meet increasing steam needs. Instead, after an engineering re-think of the company's steam generation, supply and use, energy requirements were reduced.

No new boiler is now needed.

When Mr John Mills was appointed Manager of Engineering Services at Reidrubber last year he had just retired from the RNZAF as Director of Aircraft Engineering. He had joined the air force through the university squadron at Canterbury, becoming a pilot and completing his M.E. degree after choosing the regular air force as a career.

Mr Mills' first survey at Reidrubber was to look at the operation, where Reidrubber Ltd supplies steam to three factories (Feltex Plastics, Reidrubber, and Feltex Rubber). The three factories are separate companies on a common site, using the same steam plant.



Mr J. Mills, Manager of Engineering Services (right), and Mr Val Goble, Senior Instrument and Services Engineer, discuss further means of conserving coal used at Reidrubber.

CONSERVATION

The engineering team found it could manage comfortably without a new boiler by steam conservation — lagging pipes that had been unlagged, replacing steam traps with the correct type and size, steam trap maintenance, lowering some steam pressures, reviewing operator techniques, improving steam reticulation, and ensuring higher condensate returns.

Steam lines to steam traps were changed to ideal configurations. Traps were changed to appropriate sizes, and fitters were trained by the steam trap agents in correct maintenance methods.

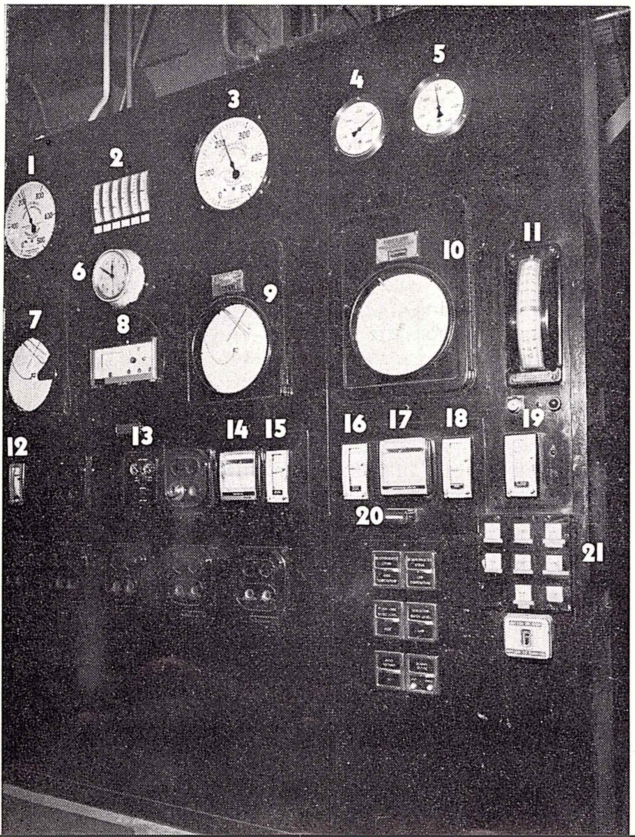
Metering steam supplies to the users increased cost consciousness and cured wasteful habits. Controllers are being fitted that drop steam pressures when a factory exceeds its quota.

Fuel was reviewed, and both gas and oil were considered for a supplementary boiler.

However: "We decided to stick to coal because of cost," Mr Mills says.

TECHNOLOGY:

Mr Goble also brought to Reidrubber the background of a different engineering technology, to be able to see time-honoured practices in steam generation with a different eye.



The control panel for steam services at Reidrubber.

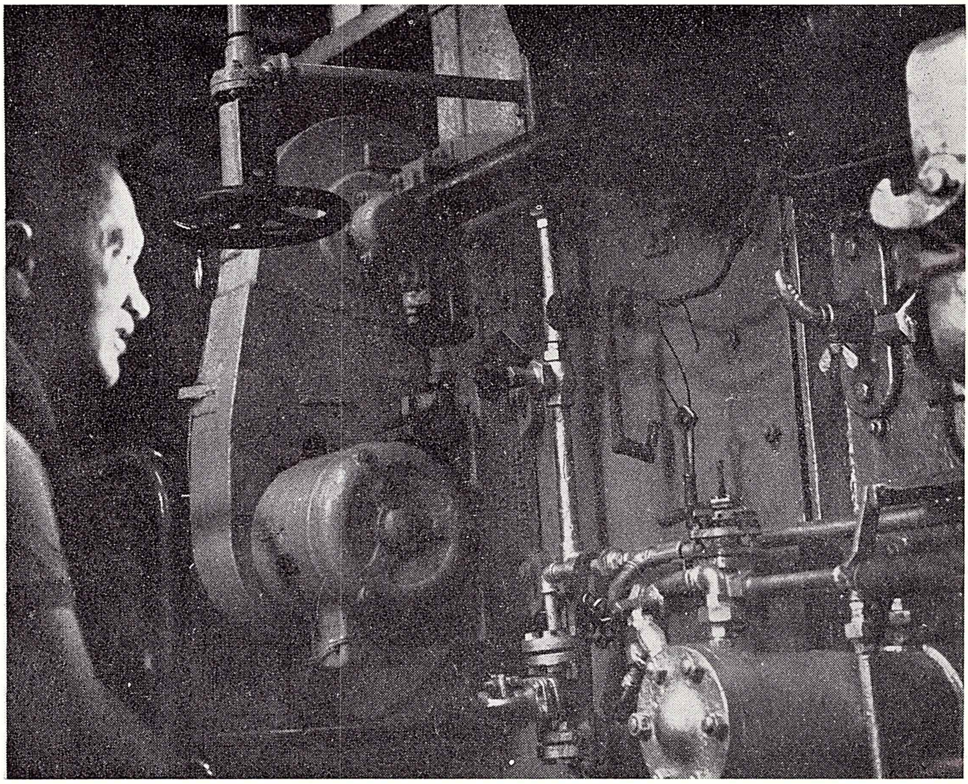
1. Boiler Steam Pressure Gauge
2. Boiler Draught Gauges
3. Economiser Feedwater Pressure Gauge
4. Plastics Factory Steam Pressure Gauge
5. General Rubber Factory Steam Pressure Gauge
6. Clock
7. Boiler Steam Flow Air Flow Meter and Controller Recorder
8. Smoke Density Meter
9. Boiler Steam Pressure % Temperature and Flue Gas Temperature Recorder
10. Plastics Factory Steam Flow Meter
11. Boiler Distant Reading Drum Level Indicator
12. Boiler Fuel Flow Controller
13. Boiler Air Flow Hand-Auto-Station
14. Boiler Drum Level Recorder
15. Boiler Drum Level Controller
16. Boiler Induced Draught Controller
17. Desuperheated Steam Temperature Recorder
18. Desuperheated Steam Controller
19. General Rubber Goods Factory Steam Press Controller
20. Coal Integration from Coal Seals
21. Boiler Main Alarm Panel

Qualified as a pilot in the wartime RNZAF, with experience flying a variety of aircraft, Mr Goble was voluntarily remustered as a flight engineer, because of an engineering background, when that aircrew classification was introduced. He stayed with aircraft after World War II as a licensed aircraft engineer with NAC, until he went to Reidrubber in 1951. He is one of about five engineers in New Zealand who hold the grade of Senior Member of the Instrument Society of America, and has taken three courses in instrument engineering overseas.

Boiler operation at Reidrubber is almost completely automated. Steam flow and steam pressure are monitored, together with the air flow through the furnace, to control the coal feed to the boiler. If water in the boiler falls to a certain level it stops the stoker and fans.

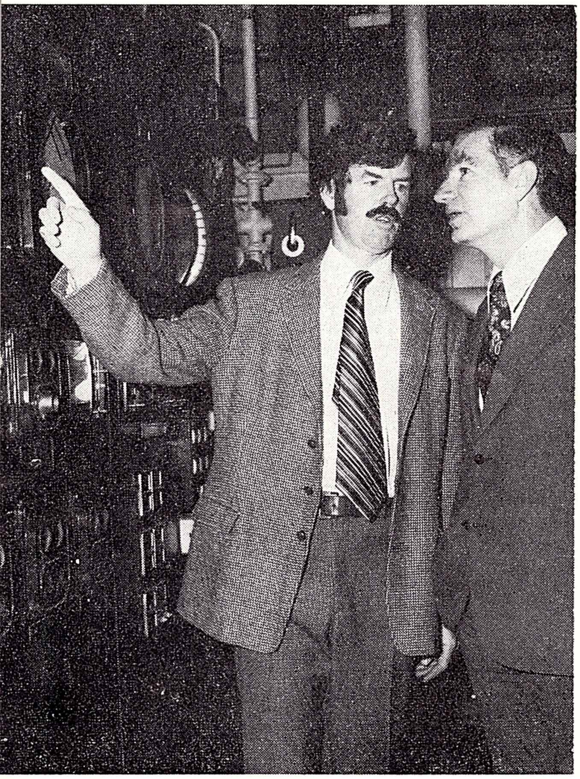
PNEUMATIC

The control system used is a miniature pneumatic transmitter system.



Mr Steve Hokai, a boilerman at Reidrubber, keeps an eye on the furnace as coal burns.

Mr J. Mills manager, engineering services, Reidrubber (left), points out features of control panel in boiler room to Minister of Mines, Fraser Colman.



An automatic cutout on the water gauge ensures that the pumps must start before the draught fans can start again.

The control system was first installed in 1949, and its design was changed in 1968.

A new alarm system to monitor the flow of coal — using differential pressure also — is being installed.

At Reidrubber coal from Kopuku mine is delivered into an underground bunker, then elevated 83 feet to a 100 tonne hopper. As it feeds to the Detroit spreader stoker it is measured into 200 lb lots. Each lot of 200 lbs triggers a counter, which records the amount of coal used.

Steam pressure and output are maintained by using the changes in steam flow to adjust the amounts of coal and air in the correct ratio to cope with the fluctuating loads before the boiler pressure actually varies.

This gives a form of predictive control which in conjunction with the computing relays gives a very close combustion control system.

EFFICIENCY

The CO_2 gases are not monitored. By beginning the combustion process by monitoring and controlling the coal, air, and steam production and adjusting each for the correct ratio the combustion efficiency is ensured. This obviates having to monitor the gas production resulting from the combustion to see if the ingredients are correctly proportioned.

The Babcock and Wilcox cross-type water tube boiler, with a maximum rating of 38,000 lbs an hour at 250 p.s.i., was installed in 1949. It has seen 26 years' service without a failure, although once an electrical switchboard caused a failure in the pumphouse.

Reidrubber Ltd uses about 10,000 tonnes of coal a year. The firm began in 1933, then in Penrose, Auckland. It moved to its present site progressively in the 1940s, beginning tyre production in 1949.

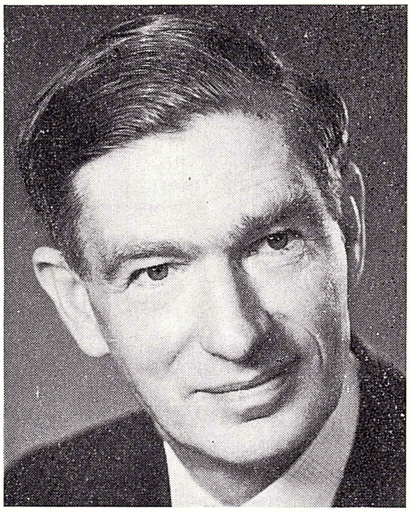
Present production of Reidrubber includes tyres and tubes for cars, trucks and the front wheels of tractors. It is the only firm in New Zealand licensed to retread aircraft tyres.

Reidrubber Ltd and its associated factories provide employment for about 1,000 people.

GOVERNMENT MOVES ON COAL

Ministers announce Ohai and Mt. Davy developments; Minister releases Mines Annual Report; further Waikato drilling.

Mechanised mining will be introduced in Southland, when a new seam of coal will be entered by drives from the existing Morley Mine at Ohai, and will be worked by continuous miners.



Hon. Fraser Colman, Minister of Mines.

Announcing this to the mine officials and the miners' union at Ohai on June 13, the Minister of Mines, the Hon. Fraser Colman, said that Cabinet had agreed to expending $1,001,000 for one continuous miner, one road header and associated equipment.

Additionally, $30,000 has been approved for labour and materials in this financial year.

Mr Colman said that the demand for Ohai coal had risen from 244,000 to 279,300 tonnes yearly between 1971 and 1974. The Mines Department expects that demand for coal at the present price will approach 300,000 tonnes.

The Minister gave these figures on the present reserves of coal at Ohai and the forecasts for their use:

Mines	Output per annum (1974)	Reserves (tons)	Remaining life at present production
Morley *	77,000 tons	2.25 million	30 years
Linton	42,000 tons	0.08 million	2 years (maximum)
Opencasts	186,000 tons	.81 million	4-4½ years (maximum)

* Morley figures include the 900,000-tonne block of coal through a fault zone from the present mine recently approved.

DIFFERENT

"Two different methods have been suggested for entering the proposed new mine," Mr Colman said. "One, supported by the Miners' Union, proposes that the mine should be entered by new stone drives from the surface. The other proposes entering by stone drives from the present Morley Mine.

"To meet the present and future demands for Ohai coal, the supply from Ohai must be expanded as soon as possible, but within five years. Failure to do this could result in a permanent market loss for Ohai coal, and could cause employment problems at Ohai."

Development of the No. 2 seam from new drives from the surface could not be completed in less than seven years, but similar development from the present Morley Mine should take only about four years.

"To be certain of being able to retain present markets for Ohai coal there is only one option open. That is, to develop the No. 2 seam from the present Morley Mine, and not to attempt new drives from the surface," Mr Colman said.

He said that he recognised that miners were conscious of the possibility of a disaster such as the fire that closed the Wairaki Mine in 1970. The Mines Department, however, had pointed out that the Morley and Wairaki mines were not comparable in assessing the potential for a Wairaki-type disaster.

The Morley Mine had been developed in panels, so that the conditions

(continued on page 6)

Right Hon. W. E. Rowling, Prime Minister.

Prime Minister Gives Mt Davy Conditional Go-ahead

On the same day that the Minister of Mines announced the decision to proceed with a new mine at Ohai, the Prime Minister, the Right Hon. W. E. Rowling, was at Westport announcing that the Government had decided in principle to allow the export of coal from Mt Davy, near Greymouth.

"The coal resources in this region stand on the edge of a development programme which was not dreamt of even a few years ago," Mr Rowling said.

"In 1971 West Coast Resources Limited, a joint New Zealand-Japanese group, was granted a prospecting licence with a conditional right to mine. They have proved the coal of the type they seek is there,

(continued on page 6)

Hon. Fraser Colman

(continued from page 5)

that caused the Wairaki fire could not occur in Morley.

PRECAUTIONS

"As an additional precaution, to be completely safe, fire doors that will separate the new stone drives from the present mine can be installed, to minimise the chance of fire in one mine spreading to the other," Mr Colman said. "I am assured by the Chief Inspector of Coal Mines, Mr T. M. Brazil, that he is satisfied that the new mine will be developed in such a way that every precaution will be taken to preserve high standards of safety and security."

Costs worked out by the Mines Department showed that the lowest cost of coal was when it was mined by the continuous miner, explained Mr Colman. If coal was to remain competitive with other fuels, and thus preserve its markets, the decision to mechanise was inevitable. This required high capital investment, but this demonstrated the Government's faith in Ohai and the coal miners, and in a wider sense, the Government's policy of regional development applicable to Southland.

"You will be aware that the rates payable to miners at Rotowaro No. 5 at Huntly, where a continuous miner is operating, are the highest in the industry," Mr Colman said. "This is because the greater productivity allows greater rates."

30 YEARS

"There are other advantages. Continuous miners require skilled tradesmen on the mine surface to service the machines, both fitters and turners, and, because of the high electrical content in these machines, electricians as well. I know that those of you with young families are often concerned about job opportunities for your children, as there seems to be little for them here unless they move to the towns. Mechanisation offers a variety of technical and trade positions and the opportunity for them to stay at home and still obtain worthwhile qualifications will be higher."

Mr Colman said that the plans to mechanise a new mine at Morley would assure the future for coal mining at Ohai for 30 years.

The Minister was accompanied on his visit to Ohai by the Secretary of Mines, Mr I. D. Dick; the Assistant Secretary (Technical), Mr W. S. Partel; the Chief Inspector of Coal Mines, Mr T. M. Brazil; and the National President and Secretary of United Mineworkers, Messrs H. Pattinson and M. Bassick respectively.

Rt.Hon.W.E.Rowling

(continued from page 5)

and that it can be extracted from extremely difficult country."

Mr Rowling said that the Government's "approval in principle" was subject to important terms and conditions, including selling price, royalties and environmental requirements.

Coking

Because the coal in question is a type of coking coal, its export had been sanctioned only after carefully considering its possible use in New Zealand. For example, electricity generation would waste the valuable properties of this coal, and there were large resources of coal for generation purposes on the West Coast, and massive proved resources in the country generally.

"This Mt Davy field offers the company 7,500,000 tonnes of coal over a 15-year period," Mr Rowling said. "That's 7,500,000 tonnes out of proved recoverable coal deposits of over 800 million tonnes in New Zealand.

"Extracting the Mt Davy coal is hardly likely to upset the balance of resources available to us."

Because of the oil situation New Zealand had been looking at all its alternative indigenous energy forms; but the Mt Davy coal was not an "energy" coal, and there was a strong demand for the Mt Davy type on the world market.

"I think that because of the present demand, leaving this coal in the ground would ignore the realities of the situation," Mr Rowling said.

People

At least 350 people will be needed for the 15-year programme while the company is taking the coal out. Over 170 will be employed directly in mining operations, involving a new technique not used previously in New Zealand.

"This will be an important boost to the area," Mr Rowling said, "and it will help develop new skills and technology for mining, which will help stem the flow of young people away from the region."

The West Coast Regional Development Council has supported the proposal, subject to the proviso that the greatest benefits to the nation are obtained.

Energy

Mr Rowling also discussed another coal-based proposal for the Buller that is already well into the investigation stages.

Three sites are being considered by the N.Z. Electricity Department for a major coal-fired power station, which is programmed to begin producing electricity in eight years' time. The site assessment report on these sites is expected in July or August and a full environmental impact report should be produced within a year.

The location will be finally decided late in 1977, and construction will begin shortly after.

"We must have a thermal plant in the South Island to complement the Clutha development," Mr Rowling said. "The coal of the Buller will be used for this, and the workers of the region will help provide the manpower, particularly at the mine site, and during construction."

About another 250 people will be involved in running the station. Many of them will live in and around Westport, which will boost the local economy considerably. Because the mining staff extracting the coal will be extra to the figure of 250, the increase in the local work force could be even higher.

☆ ☆ ☆

COMMENT

COMMENT — *From the British "Coal News", April issue.*

Just how important is the coal industry to a prosperous Britain?

We provide 40 per cent of the nation's energy needs, all home-produced fuel which is not a burden on the balance of payments.

Or to put it another way, each extra million tons of coal we mine saves the nation no less than £25 million which would otherwise have to be paid for imported oil.

We have the capacity to mine more coal, as the output increases in March to over 2.6 million tons a week demonstrated. There is scope for continuing output increases — which also, of course, earn higher production bonuses.

Big Role

The importance of coal to Britain is emphasised in the Plan for Coal, which has been approved by the Government.

It will be raised at the inquiry into the new mine at Selby — in Yorkshire — and it is the reason for the planning of a possible new mine near Stafford.

Coal can have a big role in satisfying Britain's future energy needs.

The industry's own efforts will go a long way to decide the extent of coal's new era of expansion. The end-of-the-year output boost means we have made an encouraging start.

SUCCESSFUL YEAR FOR MINES DEPARTMENT

The Hon. F. M. Colman, Minister of Mines, said after tabling in the House of Representatives the Mines Department annual report for the year ended December 31, 1974, that he considered it had been a "most successful year".

"Though no new major mineral deposits were reported during 1974, utilisation of existing resources, particularly coal, increased, and there was continuing interest shown in petroleum prospecting," he said.

"A total of 2,564,317 tonnes of coal was produced, an increase of 95,766 tonnes on the previous year. Of the total production, underground mines acounted for 805,504 tonnes (31.42 per cent) and open-cast mines produced 1,758,813 tonnes (68.58 per cent)."

The Minister said he was greatly impressed by the efficiency and productivity in the State coal mines.

"They have demonstrated a proved record of efficiency, productivity and foresight which few, if any, organisations of comparable size in New Zealand can match, let alone surpass," he said.

"Despite fewer miners engaged in the industry, production has, since 1967, risen from 1,415,000 tonnes, an output of 557 tonnes per man employed, to 1,785,000 tonnes, or 1,392 tonnes per man employed in 1974.

"In other words, in 1974 we produced 26 per cent more coal than we did in 1967 with almost exactly half the number of men."

The cost per tonne in 1974, at $7.67, was lower than the cost per tonne. $7.82, in 1967, in spite of the fact that the average shift wage had almost doubled.

Thriving

"The Mines Department believed that the production of coal would continue to play an increasingly important part in New Zealand's development," Mr Colman said.

The annual report noted that "because of the loss of sales to railways, ships and gas works (losses which State Coal Mines were powerless to prevent), the public and others had regarded coal as a dying industry, saved only by the energy crisis.

"In fact," the report stated, "one prominent committee wrote in early 1975: 'During the last 10 years the demand for coal had dwindled, and it has been the rather unhappy function of the State Coal Mines to preside over the gradual decline of the industry'."

The same committee was told that, in 1968, the State Coal Mines had planned for a 77 per cent increase in production by 1978.

"The Fuel and Power Committee of the National Development Conference publicity reported to the second plenary session of the committee, in May 1969 — long before the energy crisis — that it foresaw an increase in coal production from 2,236,000 tonnes in 1967 to 3,303,000 tonnes in 1978.

"Its forecast (made in 1969) of coal consumption in 1973 was 2,501,000 tonnes, compared with the 2,496,000 which actually occurred,' 'the statement says.

"Had it not been for decisions — made in 1968 — to introduce underground mechanisation, current plans to supply coal in 1978 for the Huntly power station could never have been envisaged.

"Had the department not sought approval in September 1972 (well before the energy crisis) to commence investigations to supply the coal to the station, then the power station would have had to use oil 'till the Maui gas came ashore."

Seven Close, Six Begin

Seven coal mines closed during 1974, while work began on six new sites.

Alison mine, previously one of the largest producing units in the Waikato area, ceased producing in May, when the supply of recoverable coal by underground methods was exhausted.

Puponga mine, in the Nelson area, closed early in the year for economic reasons.

In the Reefton area, the Dauntless mine worked out its reserves near the end of the year; the Echo mine in the Garvey Creek area was closed when a large slip demolished the flumeway and part of the bin structure; and the Advance mine in the Waitahu area exhausted its reserves of recoverable coal in mid-year.

The upper levels of the first North Mount William mine, in the Buller area, were completely depillared in the latter part of the year.

Ohai's No. 3 Linton mine developed a heating in the old workings in the later part of the year, and as the remaining reserves were low, and isolating of the heating was extremely difficult, the area was abandoned and sealed.

Huntly

In the Huntly district, two stone drives were begun to provide material and conveyor service ways for the No. 5 extended mine.

The new Haulage mine began producing in mid February, using scraper loaders to depillar a previously-worked area of Rotowaro No. 1 mine. A start was also made to reopen the Rotowaro No. 3 mine, which is in a seam underlying Rotowaro No. 1 mine.

In addition to the underground ventures, Callaghan's opencast began producing and contractors started stripping the Maori Farm area.

Work also began on several South Island deposits.

New entries were driven into lower levels of the North Mount William seam, using hydro mining methods from the same water supply line that previously serviced the upper area.

Production began in the Waitahu Mine, Reefton, under difficult conditions. Gradients are steep, the seam relatively thin and the roof is heavy.

In the Ohai district the stone drive in Morley Mine to tap No. 1 seam met extremely difficult conditions in the shattered fault zone, which required resupporting with steel girders before the drive could continue advancing.

Harmonious

"Industrial relations in the coal-mining industry have been, on the whole, very harmonious," Mr Colman said.

"In our largest district, Huntly, we have had excellent co-operation with the United Mineworkers, the inspectorate, and others in introducing the most modern underground machinery currently available," Mr Colman said.

"The introduction of this equipment has enabled us to achieve a five-fold increase in underground productivity, without industrial upheavals."

Escalating energy costs challenge coal industry with opportunity

One man's meat is another man's poison: rising costs of other forms of energy is coal's opportunity to win new markets.

The prospect of new customers presents the coal industry with a challenge. To meet new demands for coal the industry needs to streamline its service and efficiency, an obvious area being to improve coal handling and storage. In this article Mr Miller Jeromson, Marketing Manager for David Lloyd Ltd sets out his ideas on improved coal handling to stimulate ideas and action.

In our next issue "Coal" will describe the comprehensive range of coal handling equipment currently being developed by the Coal Research Association, and the ideas being examined by the C.R.A.

Miller Jeromson, Marketing Manager for David Lloyd Ltd. Miller says "I hope through this article to stimulate ideas and discussions on ways of improving coal handling systems. I believe in coal as a reliable and clean fuel and I am trying to arouse interest in making it more so.'

INDUSTRIAL COAL HANDLING

By Miller Jeromson, Marketing Manager, David Lloyd Ltd.

Several variants of coal handling have not helped coal in the past. Many of these variants have caused frequent breakdowns and high maintenance costs. Now that energy costs are being reviewed by industry — and inevitably focussing attention on coal's real cost advantages — there is far more encouragement for the coal industry to respond by improving the systems of handling that we offer.

Modern industry demands better systems, not only for reliability and economy, but also to satisfy the Clean Air Act. Coal handling design is also influenced by capital cost. Space requirements, flexibility and fuel degradation because of on-site handling.

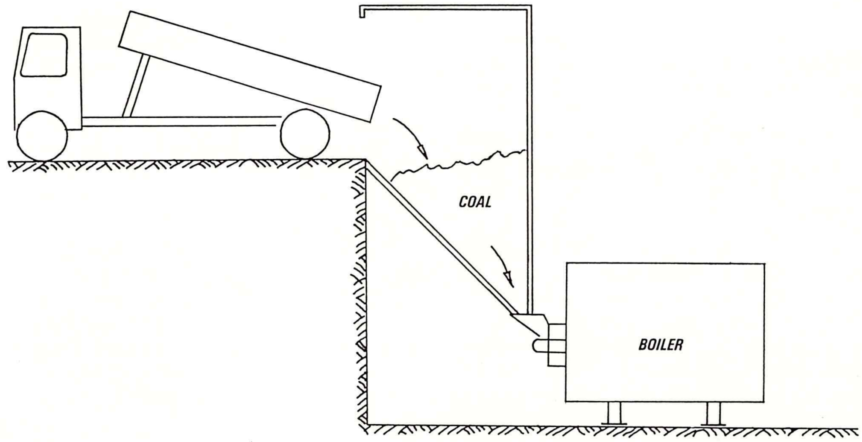


DIAGRAM (a) SHOWING GRAVITY SYSTEM

Perhaps the ideal system for coal handling is where the ground contours at the boilerhouse permit gravity feed from truck to bunkers over the boilers. (See "Boilerhouse Blues", page 36, "Coal, Winter 1974".) Unfortunately few installations are so well placed for this system. (Diagram A).

Alternatively, coal is often discharged into below-ground receiving bunkers and elevated to storage silos, to be raised again to feed the boilers. (Diagram B).

This handling reduces the particle size — indeed, in some cases, a nut grade coal is needed to feed the boilers with slack after handling. This is extra cost for the coal, plant wear and power consumption for the user, and erodes the cost advantages of coal.

Systems at present are many and varied for all capacity users. Therefore it would be wise to aim to standardise while taking into account the various situations encountered.

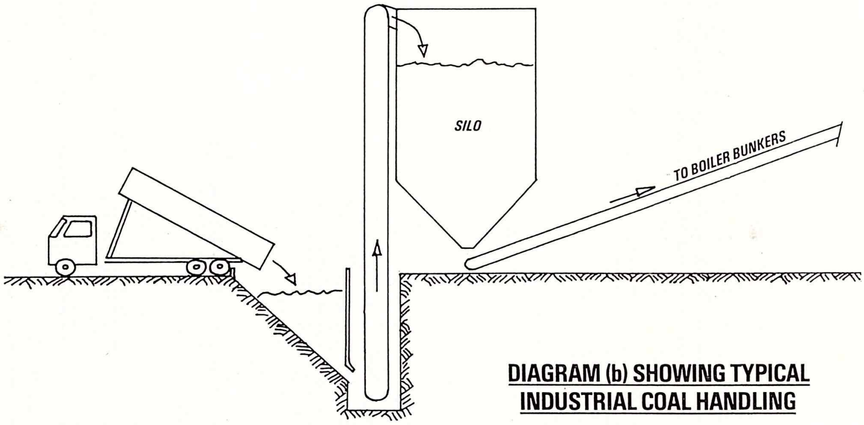


DIAGRAM (b) SHOWING TYPICAL INDUSTRIAL COAL HANDLING

An obvious system with potential emerges: containers to carry and store industrial coal.

Containers are now in common use for materials handling. They have proved practical, clean and flexible. Their potential for industrial coal has been discussed over recent years and a few exploratory steps have been taken.

As coal faces a resurgence as a highly important source of energy for New Zealand, this is the time to investigate container use thoroughly. Containers may also answer the Clean Air Act's requirements for the future.

Handling industrial coal has three main areas in design. These are:

Space occupied

Airborne pollution

Capital cost

Space occupied: Many industries considering coal expansion or conversion are limited for space around the boilerhouse. This can either:

(a) Limit coal storage capability or

(b) Reduce the area for unloading and conveying coal.

Sometimes this is overcome by using oil storage areas, but occasionally oil users want to keep a dual fuel capacity for emergency purposes.

Containers can reduce space requirements and make coal more flexible. They can store coal, or transfer coal from a remote storage area by using a flat-top truck or a special frame on wheels, or a fork lift or straddle truck.

Loading into a service bunker can be by vertical hoist, underground receiving hopper or belt screw feed from the container bottom discharge.

Airborne pollution: According to the Clean Air Act, before a new coal receiving and conveying system is installed the user must have the local authority approve it. The degree of cleanliness required will depend on the industry's location and its use.

Because New Zealand industry is largely based on food processing or is situated in urban areas, stringent requirements may be demanded.

Containers could help greatly here by:

(a) Avoiding the dumping of coal into exposed sites and

(b) Reducing the amount of conveying necessary.

Capital cost: Capital costs of container systems would vary according to the amount of use. Therefore they need investigating thoroughly.

Containers that store coal would avoid the need for bulk sheds or silos, with all their accompanying costs of foundations and building, and permanent site commitment.

Present knowledge suggests that by standardising on container design of, say, five and 10-tonne capacity, a cheaper capital outlay per tonne of coal storage capacity emerges.

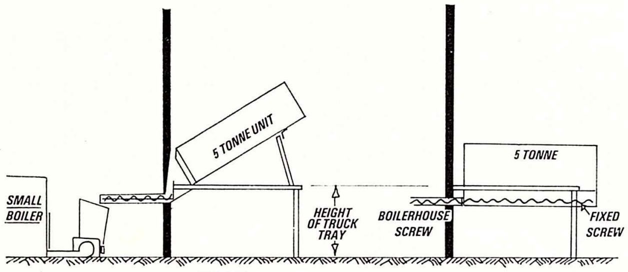
Alternatively, containers could be used only to deliver coal. This would mean a maximum of say four only to be kept on site. Possibly this would save an underground receiving bunker, associated conveyor and anti-dust equipment and reduce degradation through multi-handling.

Here it must be said that indications of relative costs can be worked out only after studying an individual plant and its needs.

SUMMARY

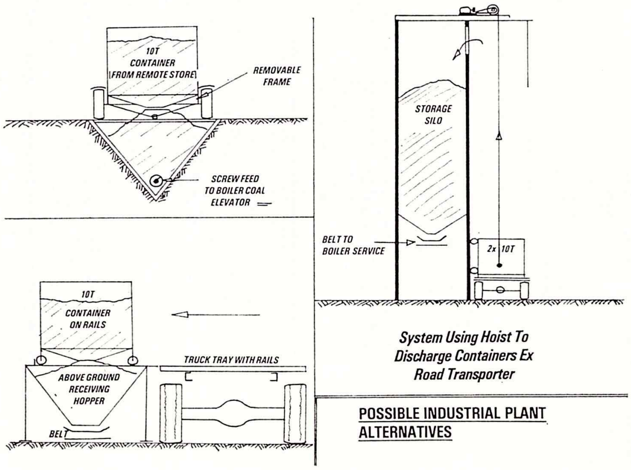
Where the use of coal is resisted, reasons given now usually fall into at least one of three categories:

1. "It's dirty to handle"
2. "Has high maintenance in time and cost' '
3. "Ash to handle".



POSSIBLE SMALL BOILER ALTERNATIVES

FULL CONTAINER DELIVERED AND EMPTY TAKEN



System Using Hoist To Discharge Containers Ex Road Transporter

POSSIBLE INDUSTRIAL PLANT ALTERNATIVES

Logically, the use of containers should be investigated to overcome these objections. A bonus that comes with containers is their flexibility — a most important consideration for modern industry.

Transporting containers should be no problem to carriers, and users serviced in this way would be the first to adopt the principle. To rail coal containers has some obvious problems. Although these may take longer to resolve, they should not be insoluble.

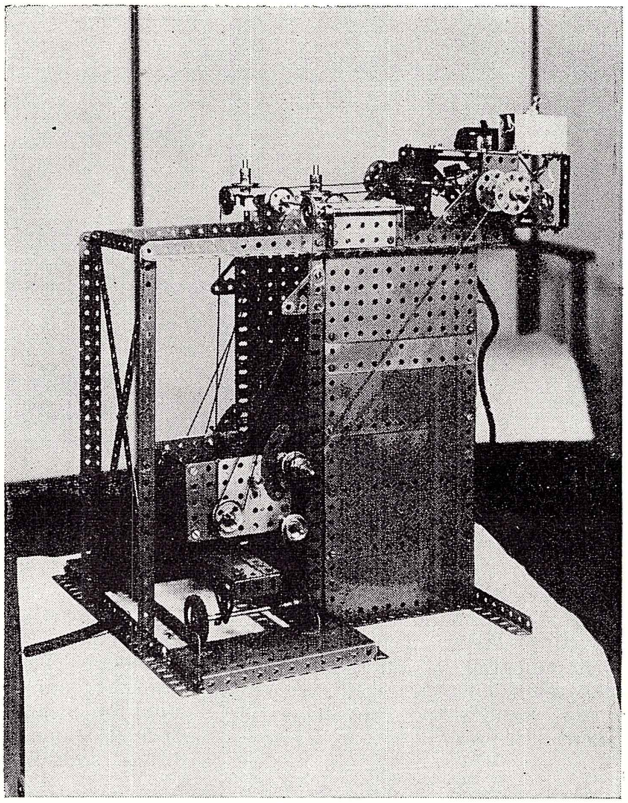
Coal has the ball at its feet now. Therefore it is to be hoped that a reasonable amount of co-operation can be attained within the industry to improve coal service as a good, reliable and clean fuel.

This article does not claim to evaluate coal's image, nor to provide a complete answer. Its purpose will be served if it points to the need to: "Avoid wind-blown dust and dirt" "Trust New Zealand Coal: sure can!"

NEXT ISSUE: Coal Research Association's review of coal handling plans.

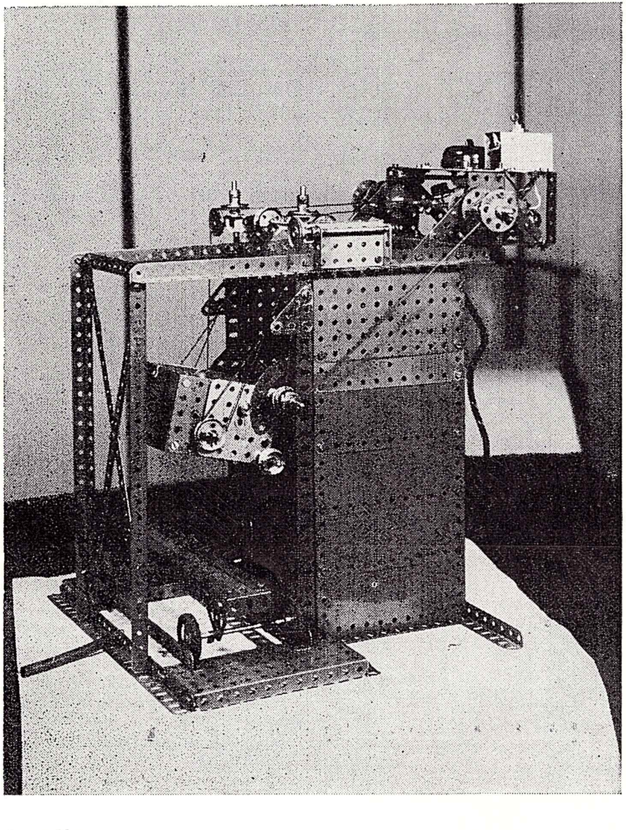
Meccano model of a coal container handling system proposed by David Lloyd Ltd. The firm does not suggest that this is the ultimate or only way to handle coal containers. The model sets out to demonstrate the practicability of container handling. It was designed and constructed by Mr A. J. Wildy, a consulting engineer of Auckland.

A somewhat similar system developed by the Coal Research Association will be in the next issue of "Coal"

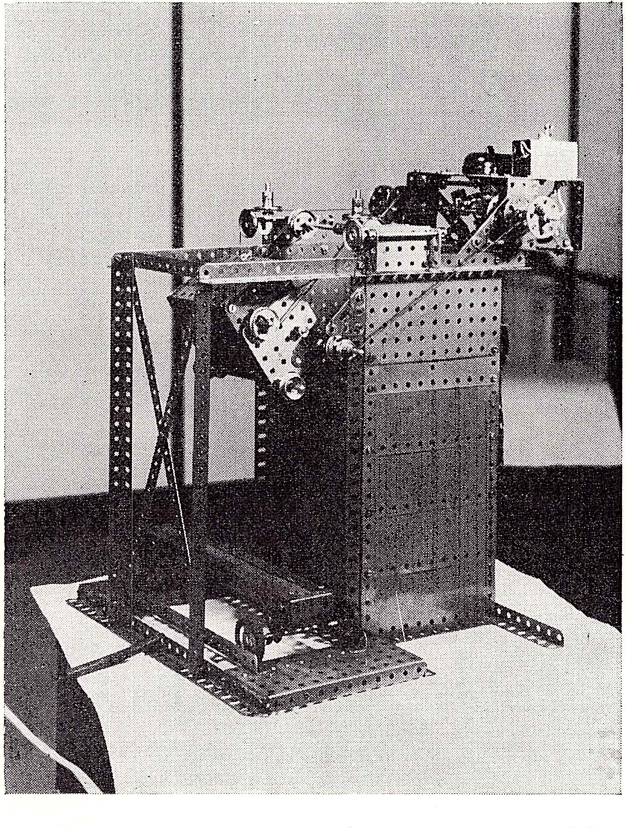


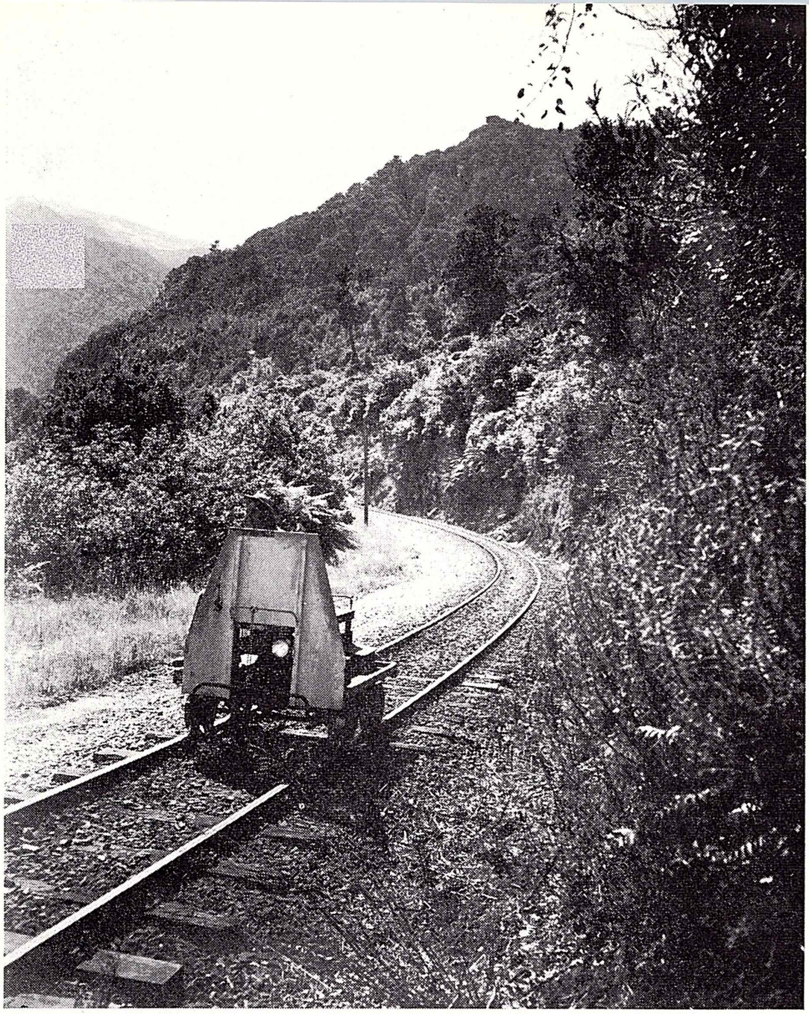
(a) A flat truck or trailer delivers a coal system to the container elevator. The system begins raising the container.

(b) The container rising and begining to tip as it approaches the lip of the bunker.



(c) At maximum travel, the container is now tipping coal into the bunker. The whole lifting operation can be carried out by one operator, using equipment adapted for the special lift.





The gradient of the line is 1 in 33.

Coal Mining provides Tourists with Scenic Attraction

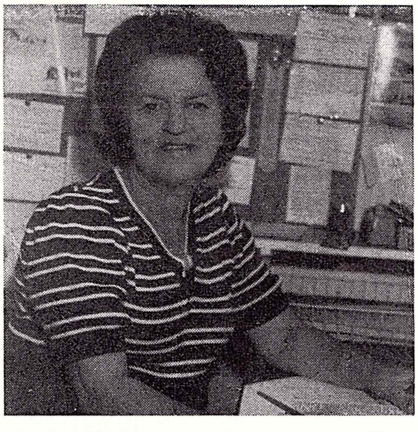
REWANUI INCLINE

TOURIST PROMOTION

Access to Liverpool State Coal Mine and private mines at Rewanui, Greymouth, is possible only by railway — there is no road to the mines.

The beauty of the bush-covered hills of the Rewanui Incline is being promoted as a tourist attraction, as an inexpensive outing for visitors to the West Coast.

In this article about West Coast tourism and the Rewanui Incline, Mrs D. M. Hogg, Public Relations Officer for Greymouth, writes for "Coal" about the tourist potential created by the coal mining industry.



Mrs D. M. Hogg, Public Relations Officer, Greymouth.

Since the opening of the Haast Pass Road in November, 1965, the West Coast of the South Island has been increasingly experiencing the benefits that come with tourism. During the past 10 years the number of visitors travelling throughout the West Coast has increased beyond all expectation. Even during the past year when many observers thought that with the general strain on the economy both in New Zealand and overseas, tourism would be the first industry to feel its immediate effects, this has not been so. Tour operators throughout the West Coast all report a bumper season.

According to Mr R. C. Harrison of the office of the West Coast Regional Development Council, jobs available on the West Coast over the past few years had declined steadily until mid-1971. Jobs were being lost through closing of uneconomic mines, sawmills and shops.

Then, in less than a year, new businesses opened that created over 200 jobs, particularly in the tourist and construction industries. It was during this time that Shantytown first opened for business. Much has been written about this award winning tourist attraction and since its opening the growth of tourism has had a continuous impact on the West Coast. The number of visitors to Shantytown last year was 137,238 and from 77,940 visitors in 1971, this represents a six percent increase each year.

New industries such as the Hokitika Free Form Glass Company and the V.I.P. Leather Studios cater almost exclusively to the tourist trade. Existing industries — particularly greenstone manufacture and the opossum fur trade — have expanded rapidly.

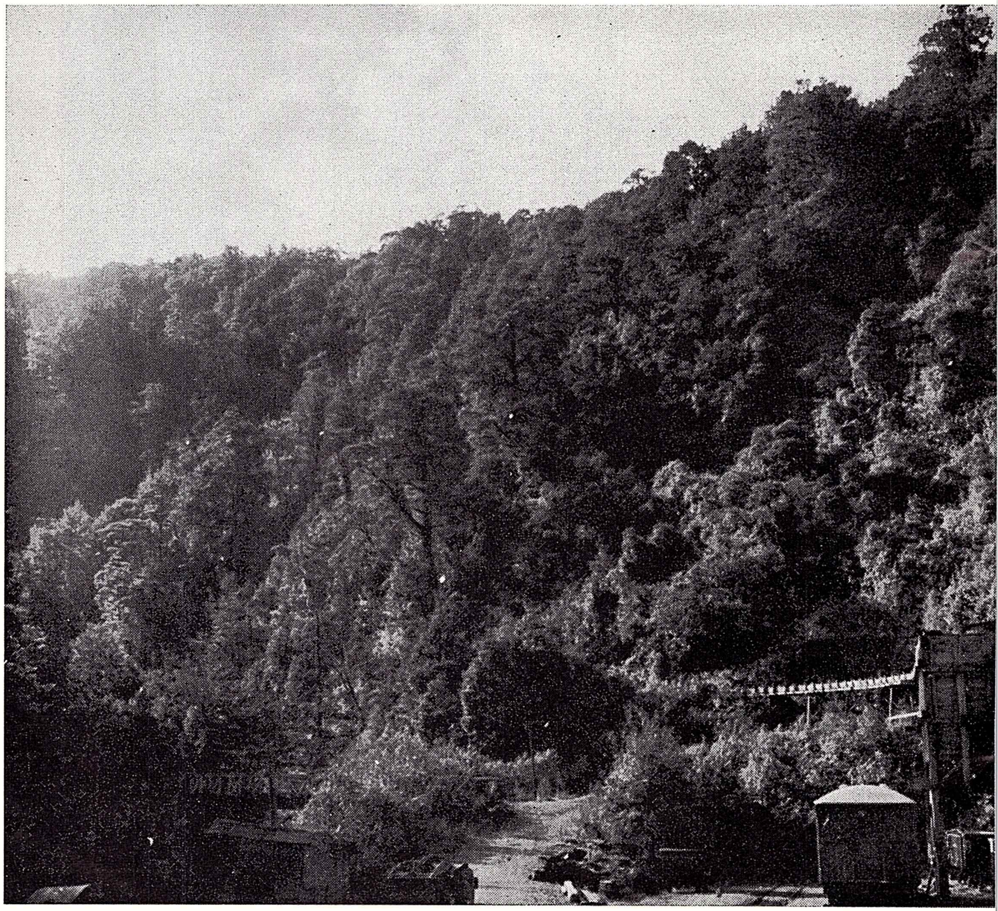
Indeed, one company was overwhelmed by financial growth problems during its attempts to expand rapidly enough to meet the increasing demand.

"It'll be a great thing to have tourists on the miners' train," says Mr H. Pattinson, president of United Mineworkers. Until his election to that position in April, Mr Pattinson was president of the Runanga State Coal Miners' Union.

Tourism was the first industry on the West Coast to show a major revival and while activities are now being supplemented by growth in manufacturing, tourism will certainly continue to play a leading role in the growth of the region. In Greymouth, there has been great expansion in the motel industry and with the rebuilding or additions to some hotels in the area, Greymouth can now host conferences on a national level and offer the first-class accommodation demanded of such conferences.

Promoting tourist attractions in Greymouth is the duty of the West Coast Public Relations Office and Information Centre (Inc.). Its latest promotion is the train trip up the Rewanui Incline. This trip as a tourist attraction was first mooted by Mr D. B. Dallas, Commissioner for the West Coast, some six or seven years ago. Since then the trip has been included in the local Greymouth information brochure.

Last year, however, the Public Relations Office with help from the N.Z. Railways, published a sightseeing brochure which was distributed to all motels and hotels in the area. This gave prominence to the Rewanui train trip and although the train did not resume its normal schedule until the Liverpool Mine re-opened on January 13, it brought an overwhelming response from visitors — over 700 people availed themselves of this trip in the first 10 days of operation.



The afternoon train stops at Rewanui for 25 minutes, giving tourists the opportunity to see the surface workings of the Liverpool State Coal Mine.

Officials of the NZR were gratified with the response so much so, that representations to have the train running next year have been successful and visitors over the early part of January 1976 will be able to go on the train trip although the mines will be closed on annual holidays.

The Public Relations Office has been promoting this trip to visiting school parties for many years now and all agree that it is a "must".

The Liverpool Mine is on the western side of the Paparoa Range, 12 kilometres from Greymouth and is 192 metres above sea level. It is possible to drive by car to Dunollie which is 36 metres above sea level but the remaining 4.8 kilometres to the Liverpool Mine at Rewanui is accessible only by train. The gradient of the line is 1 in 33. Until six or seven years ago the rail had a centre line and was one of the last inclines to use this Fell system. The Fell brake van was used on the downhill side of the train to complement the other braking system but since diesel engines were introduced this has been done away with.

The train to Rewanui leaves from the Waterside Station at Greymouth at 1.50 p.m., Monday to Friday, and arrives at Rewanui at 2.31 p.m.

New Zealand Railways has been studying the possibilities of tourist development of the Rewanui Incline.

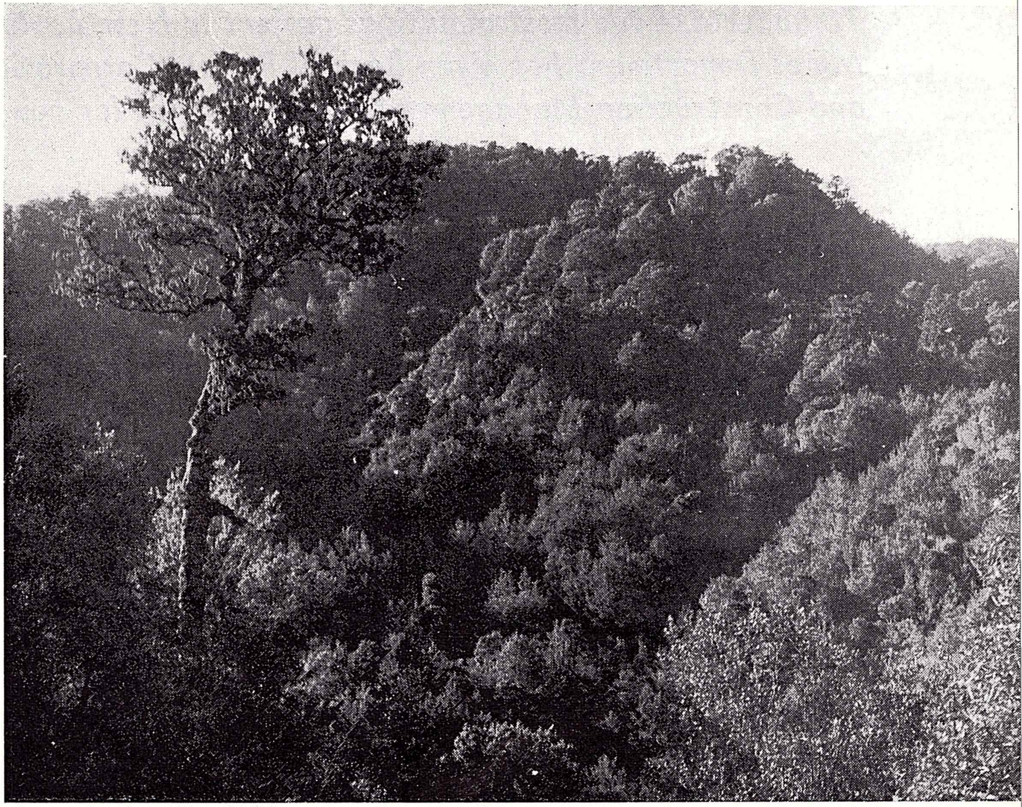
"We're very interested," says Mr Gary Arnott, of NZR Advertising and Publicity Section. "It could be a service similar to the Kingston Flyer, if the local tourist industry helps promote it.

"The Rewanui Incline trip could be a real attraction for the West Coast."

Before departing for Greymouth again, the visitor has 25 minutes to survey the surface workings of the Liverpool Mine.

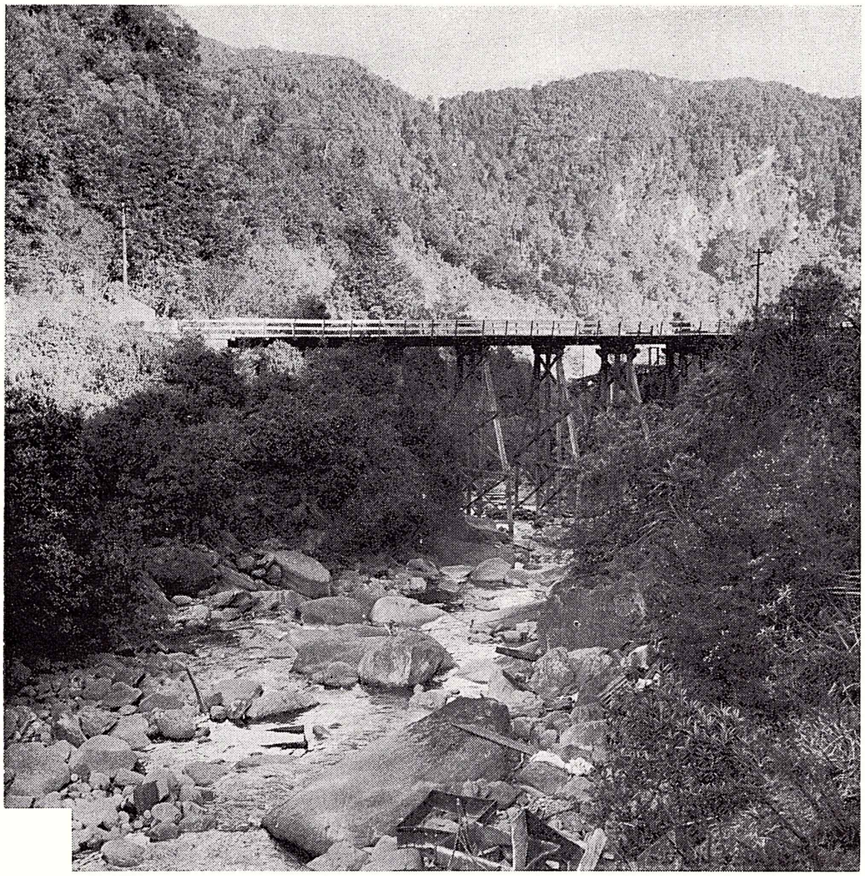
For many people, this will be the nearest they will ever get to a coal mine and even to step inside the tunnel of the Mine, to see the ventilating fan, the surface conveyor system that brings the coal from the mine mouth to the screen house then to the storage bins, is an educational insight into coal mining. Coal has been produced from Rewanui since about 1913 and with the revival of interest in all forms of energy resources, we can surely expect further development of coal on the West Coast.

Plans are in hand for further promoting this trip and it is hoped that both the Railways Department and the Mines Department will help. It has been suggested that a courier could travel on the train with visitors — an ideal job for a retired miner — to escort parties around Rewanui.



Bush scenery on the western side of the Paparoa Range. Rewanui, the terminus of the line, is 12 kilometers from Greymouth.

Mountain stream on the rail trip to Rewanui — about 40,000 tonnes of coal pass over this bridge every year, going from Liverpool Mine to Greymouth.



Perhaps, it will be possible later, for the Mines Department to provide a building at Rewanui where Coal mining history and relics could be seen.

The trip in itself is unique and does not need the usual "additives" that many tourist attractions have to affect. The visitor enjoys travelling on the "miner's train". They enjoy the friendly greeting they receive from the miners and are always fascinated of course, by the West Coast card game of 45's that seems to get under way as soon as the train gets in motion.

Yes, the train trip to Rewanui could well be almost as successful as Shantytown and given the necessary amount of promotion this could well be another very strong incentive for our many visitors to stay another day in our town.

To undertake the most ambitious project in New Zealand coal mining history, Mines Department has given Bechtel Pacific Corporation Engineering, Procurement and Construction Management responsibilities for new mines at Huntly.

The Huntly Project will be administered from Bechtel jobsite office at Huntly, with engineering, procurement and support activities from Bechtel office in Melbourne (head office for projects undertaken by the organisation in the Australasian area).

At peak, Bechtel staff at Huntly will number approximately 50, of these, approximately 25 will be New Zealanders.

Huntly Mines Project For Bechtel

Initial engineering and planning for the Project began late 1974; it is expected to be complete by April 1977. The Project consists of the development of three new mines in the Huntly area, plus the associated coal handling and transport facilities, together with central workshops, administration and laboratory buildings.

Two mines will be located on the west side of the Waikato River: Huntly No. 1 Underground (in the Bryant Farm area) and an Open Cast Mine in the area of Waipuna blocks (south of Rotowaro). These new mines, when fully developed, will have a combined output of 1.7 million tonnes of coal per annum. This coal will be used as fuel for the 1000 MW power station presently being constructed at Huntly.

The third mine will be located on the east side of the Waikato River: This will be in the general area of the present Kimihia Open Cast mine. This new mine will have an output of approximately 500,000 tonnes per annum and will supply State Coal Mines present customers which include N.Z. Steel and N.Z.E.D.

Huntly No. 1 Mine will consist of two inclined, parallel tunnels each approximately 900 metres in length, 4½ metres wide and 3½ metres high. These tunnels will be on a grade of 1 in 4 and will be concrete lined where required. One of these tunnels will be used for men and material access and the second will house a conveyor to bring the coal to the surface. Other facilities to be constructed for the No. 1 Mine will include day maintenance workshop, change house, car parks, winch house and a 1000 tonne storage bin.

A study is being made by Bechtel to determine optimum mode of transporting coal from the proposed Open Cast mine to the 1000 tonne storage bin at No. 1 Mine. These studies include the possible use of conveyors, rail transport or road haulage to transport this coal.

Both underground mines (Huntly No. 1 and the East Mine) will be fully mechanised, and will involve the use of continuous miners. The East Mine will essentially be a duplicate of the facilities at the Huntly No. 1. The tunnels are expected to be shorter and shallower and a coal preparation plant may also be required. In addition, facilities for rail and road loadout will be required at the East Mine.

Design of the underground mines, together with specifications for all underground equipment is the responsibility of the Mines Department or their consultant (Mr M. Nielsen).

Bechtel Pacific Corporation Limited are responsible for all other engineering, and for all procurement and for construction management of the project.

Site activities will be undertaken by contractors: Bechtel propose awarding approximately 25 separate contracts for the project. Bechtel as part of their construction management responsibilities, shall, on behalf of the Mines Department administer these contracts and oversee the quality of work.

Bechtel anticipate that the construction programme will require a peak work force of approximately 650 men. It is planned to establish a single men's construction camp to accommodate part of the project work force.

Bechtel are no strangers to New Zealand. Although they have not previously worked with the Mines Department, Bechtel have a history of major projects in New Zealand.

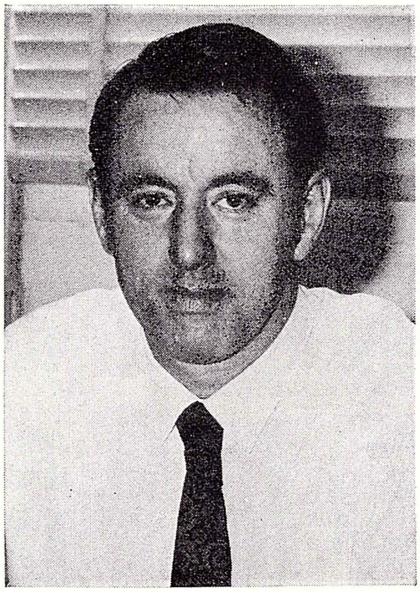
These include:

Whangarei Oil Refinery

Marsden Point Power Station

Manapouri Hydro-electric Scheme

Bechtel are currently engaged on another project to provide additional steaming and power generation facilities at Marsden Point.



Bechtel's Project Manager, H. J. Smith.

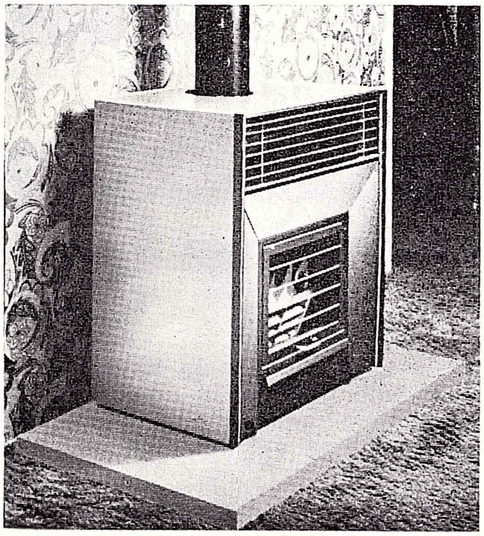
The development of the new coal mines at Huntly will be strictly in accord with the environmental impact reports prepared by the Mines Department and the Commissioner of the Environment. As part of the project, tree screens will be planted around various mines facilities. As well as giving a pleasing aspect, these will help prevent dust and noise nuisance in the area of the mines.

A new administration building is to be constructed adjuacent to the Weaver Crossing Open Cast Mine. This has been designed to blend in with the surrounding area.

Central workshops and major maintenance facilities are to be constructed adjacent to the Weavers Crossing Open Cast Coal Mine and will be similarly landscaped to give an attractive appearance.

The Huntly Miners' Hostel in Parry Street, Huntly will be taken over during the course of the project and will be used as the central site office for Bechtel operations and will also be used for staff accommodation.

WARMAIRE SERIES 75 SPACEHEATER



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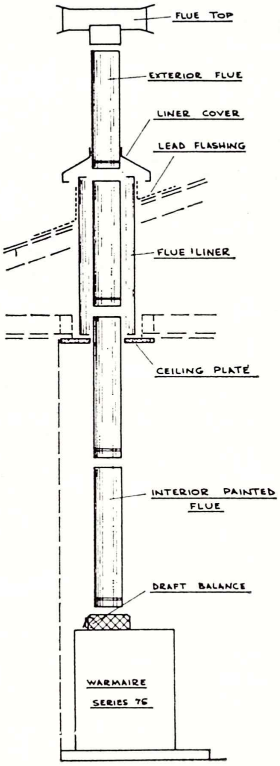
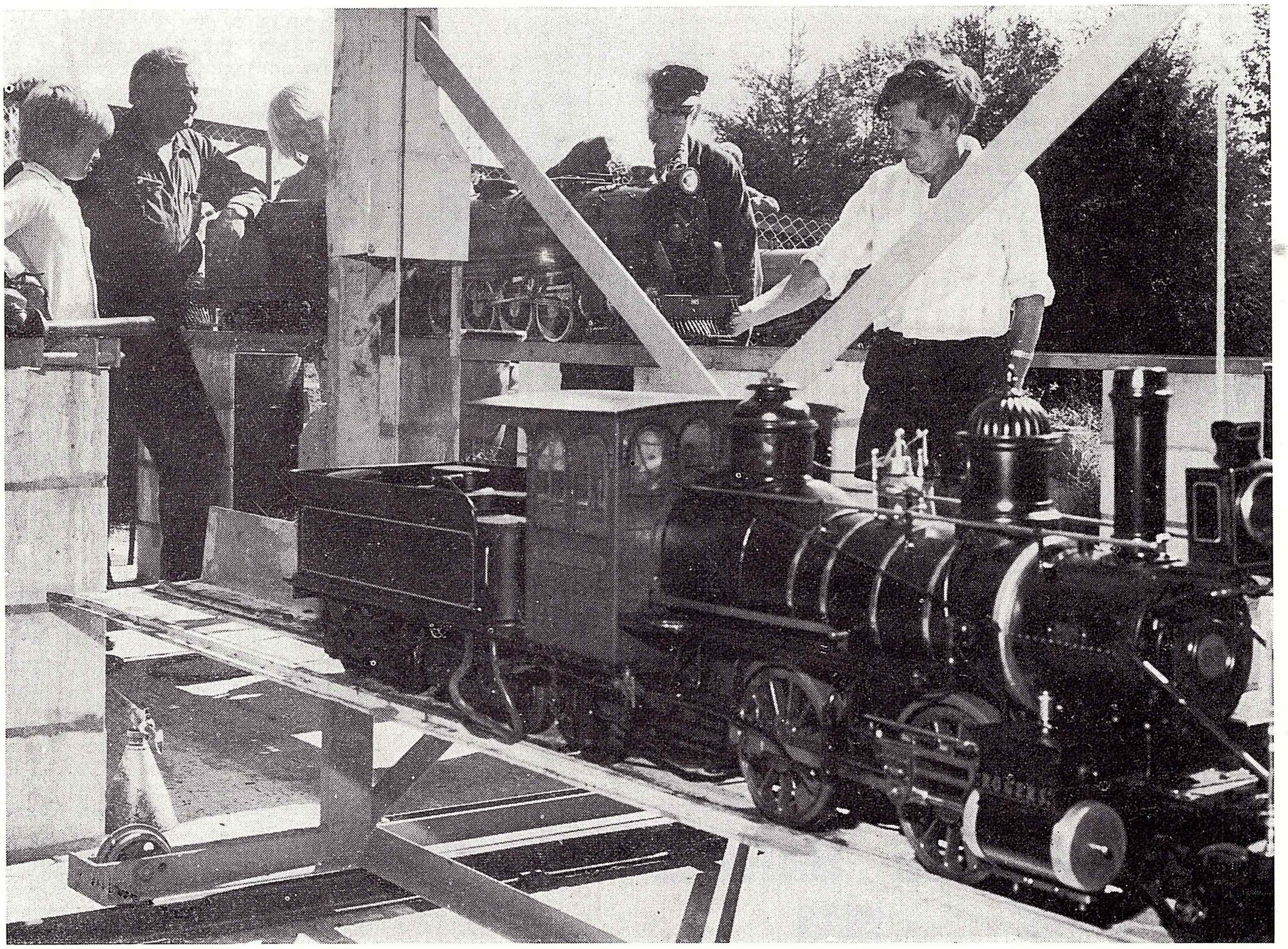


STAINLESS STEEL FLUE KITSET



The glory of 19th century steam: Aucklander Graeme Wilkinson's fine five-inch gauge NZR old class K 2-4-2 on the transporter from steaming bay to track.

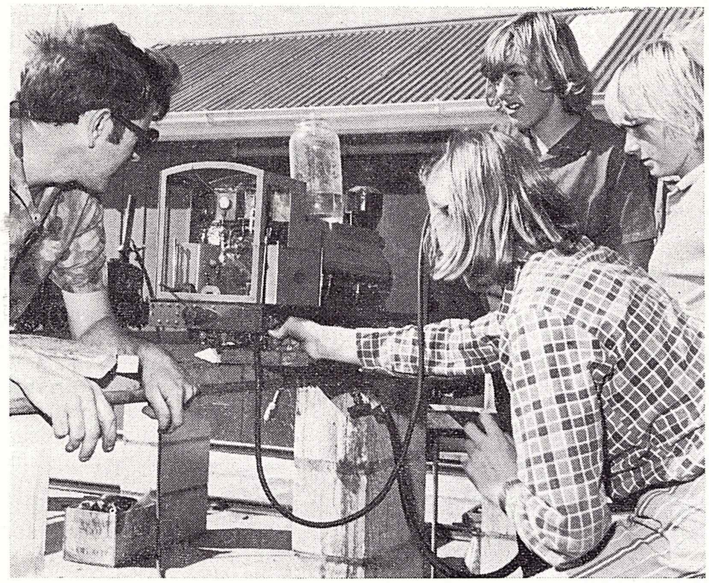
COAL FIRES AUCKLAND MODEL RAILWAY

"An engineer is a person who passes as an expert on the basis of being able to turn out with prolific fortitude strings of incomprehensible formulae calculated with micromatic precision from inconclusive experiments carried out with instruments of problematical accuracy by persons of doubtful reliability for the avowed purpose of annoying and confounding a chimerical group of hopeless fanatics referred to all too frequently as engineers."

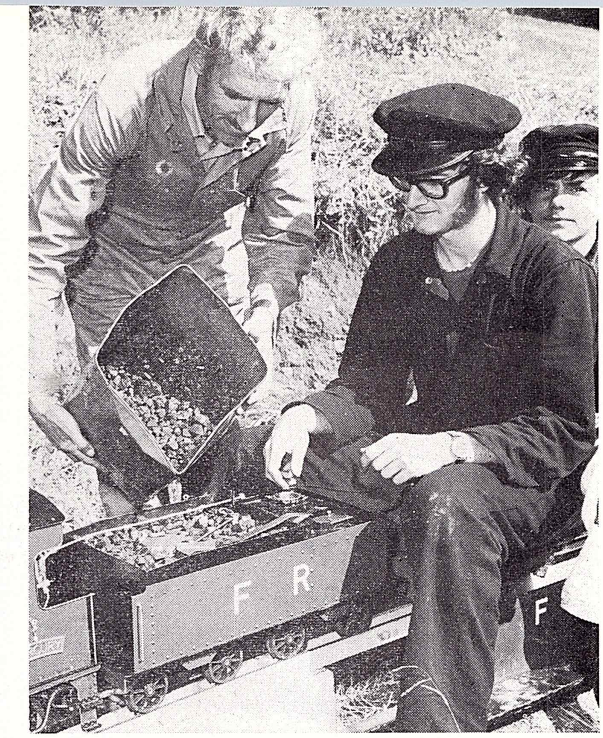
This cryptic definition hangs high on the wall of the clubhouse of the Auckland Society of Model and Experimental Engineers, Panmure Basin, Auckland. Although the collective definition does not apply to members, parts of it certainly could as one stands on the clubhouse verandah on any fine Sunday afternoon and looks out over the superb model railway track operating in a garden setting below on the picturesque shore of the lagoon.

"Coal" visited the site on a Saturday, which was the occasion of a visit by members of the Hamilton and New Plymouth societies. Consequently, the track and steaming bays were busier than the Te Rapa marshalling yards. Coal-fired steam locomotives towing waggons or passenger-carrying trolleys steamed round the quarter-mile track at 4 to 5 mph — a relative speed of 32 to 40 mph.

The club used to have an oval track on the Panmure side of the Panmure Basin, but the land was required for a swimming pool. The Mt Wellington Borough Council generously granted the club the use of a reserve on the other side of the basin on a "peppercorn" rental basis for 33 years. The old track was transferred in sections and relaid with additional track extending the length to its present 1305 feet. It now incorporates a spiral, a tunnel, a wooden truss bridge, a plate girder bridge, reverse curves,



Compressed air and water piped to the steaming bay to help steaming up . . . .



. . . . And Russell Batt coals up Alan Ure's five-inch gauge Mercury. Alan's engine is a free-lance type, and does not follow any prototype.

parallel running, embankments, cuttings and several gradients.

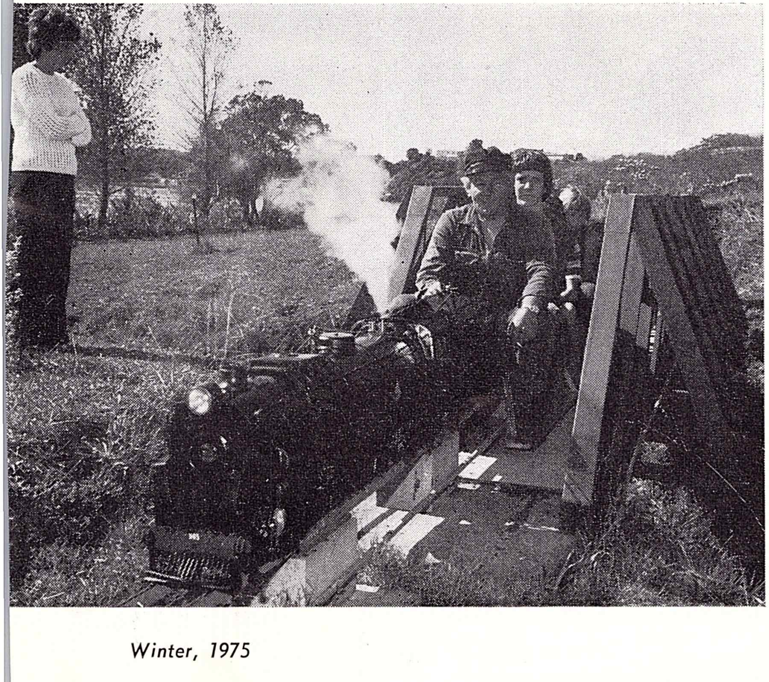
The original clubhouse was also transferred to the new site and re-erected on a block base, creating two stories. The ground floor is used for storage and houses a compressor which pipes air to the steaming bays. The upper floor provides the clubroom proper with an extensive library, a kitchen, and a verandah providing a panorama of the track.

Ten transistorised, colour light, three aspect signals are installed. Operation is by magnets attached to the locomotives which actuate reed switches set between the rails, the system being fully automatic. The effect is completely authentic and especially colourful during night runs with locomotive headlights operating.

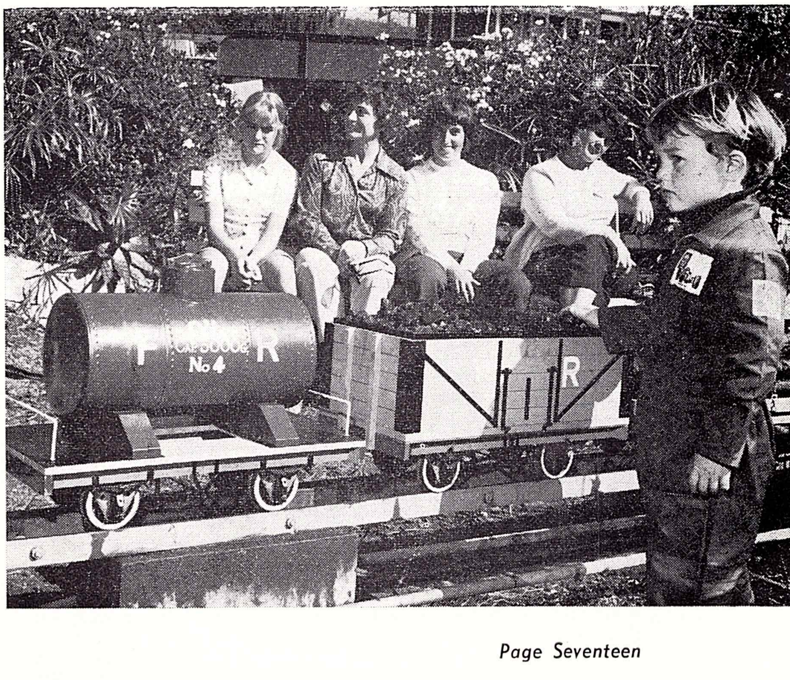
The curved tunnel is 90 feet long, constructed by the cut and cover method and made up of 6 ft diameter reinforced concrete pipes set in the hillside with approach cuttings at each end. Realistic sound effects are obtained at the upper end of the tunnel, which has a grade of 1 in 70.

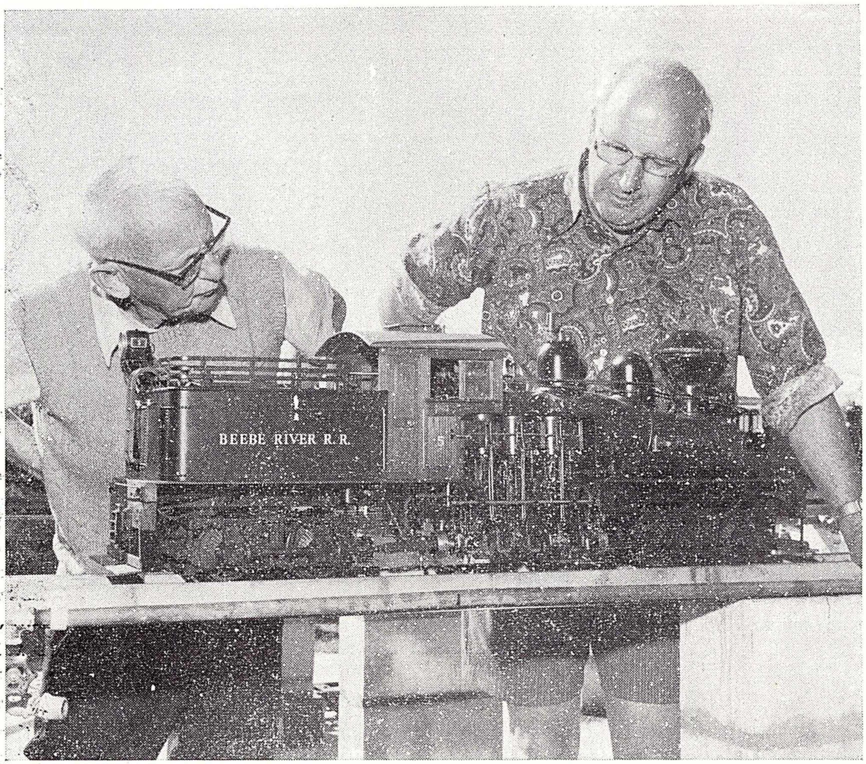
Track construction is of $1\frac{1}{2}$ in. by 5/16 in. flat steel with tubular spacers forming two gauges of $3\frac{1}{2}$ in. and 5 in. The spacers are held in place by bolts set in hollowstone cement blocks spaced five feet apart, which in turn are laid on 24 in. square concrete

No, not a West Coast coal train coming off a crossing of a Canterbury river on the Midland Line. It's Keith Bankart of Auckland at the regulator of his five-inch gauge NZR Kb class 4-8-4 locomotive — the ultimate peak of steam on New Zealand's railways.



Alan Ure's goods train for his Mercury: coal waggon an essential part of the goods.





Alex Holmes, president of the A.S.M.E.E. and Gerry Gerard of New Plymouth studying Gerry's five-inch gauge USA Shay type logging locomotive.

pads. A guard rail prevents trollies tipping. Track maintenance is negligible apart from occasional galvanised painting.

The club also owns 1100 feet of portable track which is in big demand at company picnics, school fairs, Christmas parties and other occasions.

As in most model engineering clubs the steam locomotive predominates. About 25 locomotives have been completed and over 30 more are under construction as well as several traction engines. Other facets of modelling are well represented, especially clocks, tools and stationary engines

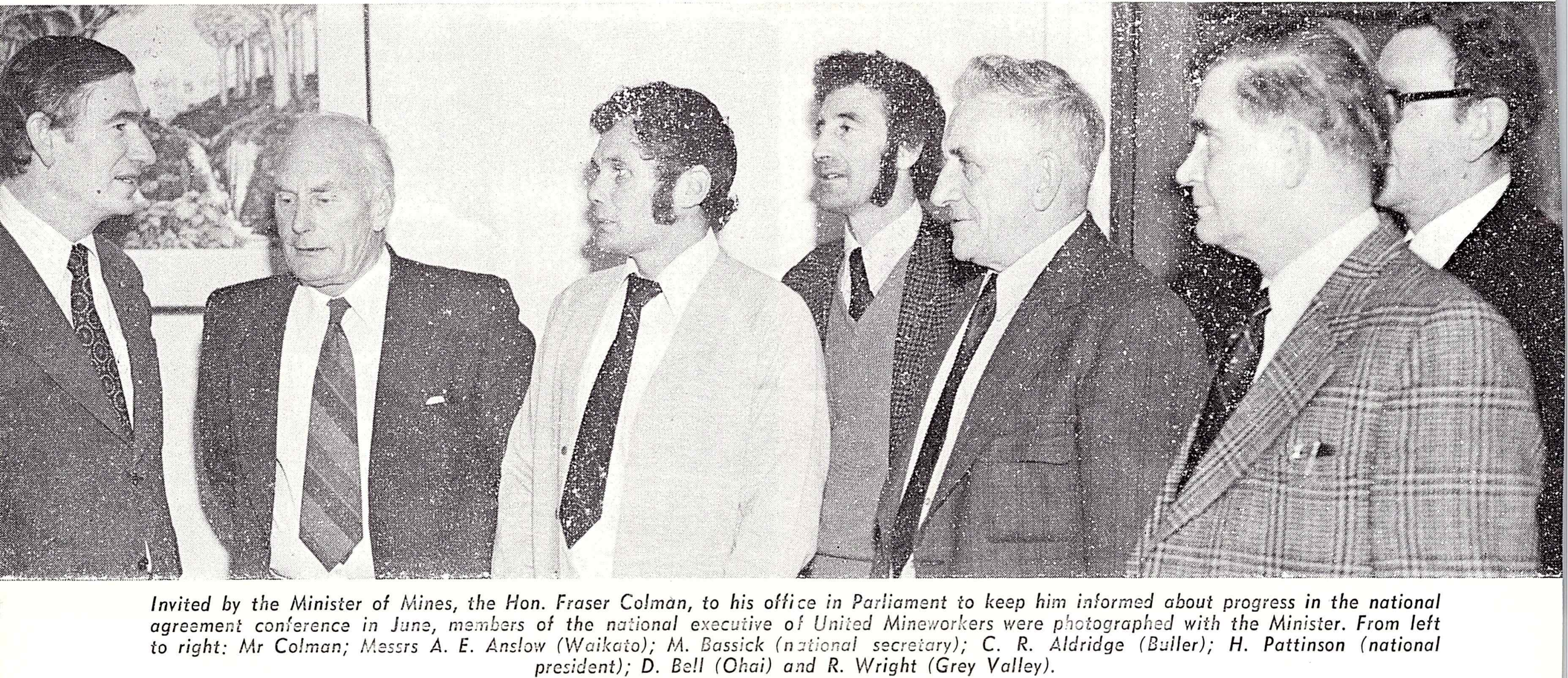
Membership of the club, one of the biggest and most active in the country, totals 150. As could be expected, the biggest majority of members are engineers but the roll also includes a magistrate, two dentists, an accountant, salesman, watchmaker and earthmoving contractor.

Coal magazine was taken for a round trip behind a coal-fired model (most of the models operate on Ray-Carbo) of NZR's now-retired Kb locomotive. Even the model is a monster, nearly eight feet long and weighing about 5 cwt. With the authentic sounds and distinctive smell, it was not hard to conjure up old memories of the "Limited" pounding through the night on its daily run between Auckland and Wellington. The Kb stopped — not at Taumarunui for "tea and pie", but at the little tile-roofed drive-through station for disembarkation and to let a group of young children take our places.

Many children, of course, have never even seen a steam locomotive in real life so the novelty of being able to see and participate in the firing, bunkering and working of a coal-fired engine in the form of a scale working model provides both an educational and enjoyable outing.

Locomotives run every Sunday afternoon throughout the year, weather permitting, with club members operating on a roster basis. No charge is made, but there is a donation box. Barbecues are regularly held along with night runs during the summer. Sometimes whistles can still be heard at midnight.

MINES MINISTER MEETS MINERS



Invited by the Minister of Mines, the Hon. Fraser Colman, to his office in Parliament to keep him informed about progress in the national agreement conference in June, members of the national executive of United Mineworkers were photographed with the Minister. From left to right: Mr Colman; Messrs A. E. Anslow (Waikato); M. Bassick (national secretary); C. R. Aldridge (Buller); H. Pattinson (national president); D. Bell (Ohai) and R. Wright (Grey Valley).

SOME PRACTICAL EXPERIENCES WITH HYDRO MINING ON THE WEST COAST

(The first of two articles)

Mr R. W. Scott, C.Eng., FIMinE, read a paper on hydro mining at Greymouth last December. "Coal" presents, in two parts, a condensed version of the paper.

Mr R. W. Scott was born in the Grey Valley and entered the coal mining industry there. He passed his first-class coal mine manager's certificate in 1949 and has managed the Kamo, Wallsend, Stockton, Strongman and Liverpool Mines. Mr Scott's introduction to hydro mining began at Stockton where many early experiments were made, and after he joined the coal mines inspectorate in 1966 his contacts with hydro work in the Buller and Reefton areas.

The facet of hydro mining which perhaps attracts most of its adherents and which can not fail to be of overriding interest to all coal mining engineers is its inherent safety. No coal mining operation can be made absolutely safe, but applying the hydro method eliminates most of the pitfalls, and those which it misses it reduces in severity.

In the past, hydro in this country has been the "cinderella" of the mining methods. No conclusive real research seems to have been done and the data resulting from what has, are not readily available.

Hydro was seen by some to be the panacea of all ills.

It was taken, and expected to be economic, into places where all other methods were proved to be too costly. In old pillar workings, sometimes partially extracted, where the places were often high, wide and ugly, it performed its function of producing coal, but because it was unable to meet the cost of picking up falls, retimbering and all the shiftwork that goes with those operations, hydro was given the cold shoulder.

Most experiments have ceased once a workable system has been found, and no effort has been made to prove by experiment whether the working system gave the best results.

It is accepted, of course, that all coals are different, and therefore probably no one system acts the same on them all; and that a general direction is all that can be expected in such things as flume gradient, quantity of water and pressure used.

Hydro has a great number of answers but naturally there are areas and conditions which are totally unsuitable for this method. Most of our experiences have been in small units which have proved remarkably successful. These units have only a limited production and no one phase of the operation is carried on for the full length of the shift. Even allowing for this limited shift time, the output per man shift (O.M.S.) is generally high and much higher than conventional methods.

From these smaller units the possible outputs of larger units have been calculated and the answers are very good, in fact good enough for someone to try and prove them wrong.

The most dangerous place in any coal mine is without doubt at the coal face. This is especially so when the face is an extracting place with high top coal, and this is exactly the type of place where the safety of hydro workings becomes evident.

There is definitely no other system of mining which provides such a high degree of safety especially in the gathering process.

With hydro, it is unnecessary for any man to enter those high goaf areas while at the same time a high percentage of coal can be won. By setting up a nozzle before shotfiring in the tops begins, hewers can stay at least 20 m (one chain) back from the face and operate the water supply valve.

Not only does the water bring the coal to safety but it creates extra air currents which tend to disperse any fire damp before it can accumulate. It also effectively suppresses any coal dust, clears away any explosive fumes, and leaves the extracted area so free of coal that the possibility of spontaneous combustion is very remote.

GRADIENTS

When working headings, steep gradients are often encountered, necessitating special precautions. On gradients over 1 in 4, it is very difficult to flume as the coal has a tendency to race well ahead of the water. In fact it may jump right out of the flume and it almost amounts to chuting the coal.

This is almost certain to create acute wear, especially where the coal lands back on the floor of the flume. Added to this it is almost always necessary to take grade off at the foot of the incline with the consequent blocking and overflowing of the flume, unless a boil box is used. To offset this it is generally wise to step flumes less than 1 in 10.

In pillaring, hydro really comes into its own with a jet of water that will throw a distance of 15.2 m (50 ft) in the air. Using a 51 mm (2 in.) nozzle and a water pressure of 344.74 kPa (60 p.s.i.) it should be possible to produce a jet of water over 12.2 m (40 ft) long. Splits in pillars should where convenient, be on a grade of 1 in 10 or less, and lifts to the full rise of the seam.

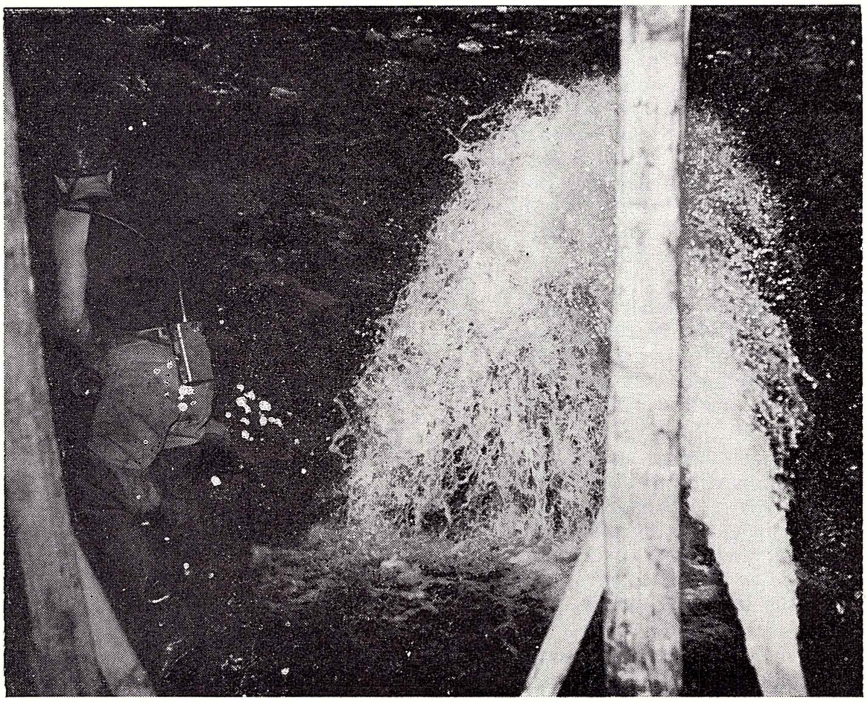
The sluicing water should be turned on before shotfiring to get the shot coal to the foot of the lift as smartly as possible after it has been broken down. During this the hewers can retire to a safe place, and when their experience tells them that alterations should be made they can turn off the water and inspect the face.

They will either redirect the nozzle at the face or attack the heap of coal that is now in the split. This coal will usually be free of roof stone, but if not, on a grade of 1 in 10 minus it should be possible to wash the coal from beneath the big pieces of stone.

Should the roof stone come with the coal it is advisable where possible, even if it means slant lifts, to reduce the gradient of the lift to about 1 in 12 and shorten the lift. In this way it is possible to wash the coal from around and even from under large pieces of stone and leave them where they are. Once the coal has reached a point where it is clear of falls it can be left in a holding bin for the flume men to take as required.

As in every other type of mining the layout needs to satisfy only the requirements of the owners, therefore it is possible to meet many varied adaptions of the basic setup.

Washing coal from the face at Mt William hydro mine, Buller coalfield.



SAFETY

In conventional and mechanised mining transport, accidents, even though now on a reduced scale, loom large in accident statistics.

If the opportunity were given to eliminate haulage smashes, derailments, falls caused by displaced timber together with all the back injuries and strains, few would pass it by at any price. Hydro offers all these things and many more besides. Eliminating roadway dust thrown into the air by flapping haulage ropes, dust generated at loading and transfer points and also what is removed from skips or belts, has a very marked effect on the safety of the whole pit.

As most of those occur in the intake airway the air borne dust moves into the working faces where it is least appreciated. Hydro keeps the mine atmosphere safe from coal dust explosions, and the workmen do not have the worry of pneumoconiosis.

Not only is dust pollution practically eliminated but noise pollution is virtually done away with also. Once coal is floating in the main flume its passage goes almost unheard. Noisy roadway junctions with skips rattling in from about three directions are gone forever and with them the chances of trapping those whose senses are dulled by too much noise. Runaway rope roads and jigs, where both empties and full ones can prove lethal, becomes a nightmare of a former generation.

FLUMES

All flumes should have sufficient water in them to float the coal.

To this end it is desirable to have a flume that is not too wide at the bottom and with outward sloping sides so that blockages will be reduced to a minimum.

Main flumes have been run on gradients as low as 1 in 130, and as steep as 1 in 3, but preferably 1 in 25. The 1 in 3 grade would require stepping, and its effective gradient would be in the vicinity of 1 in 15 to 1 in 30.

The effective gradient of a flume is the lowest grade which has sufficient length to effect the performance of the flume. The stepping of the flume reduces its capacity considerably but it is unlikely that a portion of the line which is fairly flat would ever keep pace with the full capacity of the steep.

Going off the steep on to a lower grade it is possible to enlarge the flume and increase the water supply by means of a back valve, but if the steep is not stepped wear will be excessive.

SPECIFICATIONS

There are many variables to be taken into account when arriving at the specifications of a suitable flume — grade, flume size, water, type of coal, and also straightness and desired output.

Fortunately this number of variables tends to facilitate the finding of specifications that will at least work. If for various reasons it is undesirable to alter any one particular dimension, then one of the others could make significant changes enough to satisfy the conditions. By the same token, the abundance of variables can bring about many difficulties and confusion.

The most practical gradient for a flume is between 1 in 25 and 1 in 30, and any one starting with the grade will achieve something. While it is necessary to keep a check on the gradients it is undesirable for the flume to be off the floor for any distance.

Flumes up on legs have two big disadvantages, should they block and overflow a quantity of coal can be lost and if the foundations for the legs are washed out it means the collapse of the structure.

It is also undesirable to allow small coal to come to rest on the floor of the flume and remain stagnant.

Elevating coal by any of the hydro methods does much for the general safety of the mine where it is employed. By passing the coal inside a pipe line, nothing in the mine is in any way interfered with; the atmosphere, other than being cooled, is not changed; no physical damage is done in any roadway; broken ropes and belts do not occur; and the various minor haulage accidents are eliminated.

New Zealand experience lists four main hydro elevators all of which have been tried under many conditions, and all have found an area in which they are successful. They are, not in any order of priority; the hydraulic elevator or blow-up, the high pressure hydraulic hoist, the low pressure hydraulic hoist, and the coal or solids handling pump.

Although only a little research has been done on any of them in this country they have each found a set of circumstances to which they are most adaptable.

SCREENING

Most bins at New Zealand mines, with their reciprocating or vibrating screens, transfer points, dry coal and high drops, are rather alarming from a dust point of view.

With the introduction of hydro mining all this is eliminated, and there is no danger of anyone suffering from pneumoconiosis. Welding and gas cutting operations can be undertaken at any time without prior preparation, even while the screening plant is working.

It is at the screens where the present weak link of the hydro system is really found. Here, where water and coal must be separated, we face a drawback in the system that is only partially solved. When fine coal goes into suspension in water, it is a time-consuming operation to separate them completely. Where suitable areas of land are available, providing settling ponds is still probably the cheapest and best method. Cleaning out the ponds is relatively simple but they must be fairly large to be effective.

There are other mechanical methods such as centrifuges, but all have a definite limit to the quantity they can handle. It is this phase of hydro mining, fines, where research could be made advantageously.

A really concentrated research programme into this should be undertaken before any large-scale hydro is decided upon.

If the coal is transported to the bin by hydro it has to be dewatered before it passes on to the screen. This is done by sharply increasing the grade of the last 2 m (6 ft) of flume so that the coal will pass over this portion with only the slightest assistance from the water. To remove the bulk of the water, sheets of 1.6 mm (1/16 in.) perforated gauze are inserted into the sides and floor of the flume, replacing boards. The water with the suspended fines is led to the settling ponds, and the coal to the rotary screen.

The rotary screen is a very small power user, in fact it can be driven hydraulically if desired, and is an effective screen, especially when handling a wet product.

There are some coals that have to be wet screened before a ready sale can be found for them. Rotary screens have been in use for many years, but not so much in the coal industry as in metalliferous operations. The old-time objection to damp coal has almost been lost in the quest for a cleaner product.

The smooth action of the rotary does much for the life of the bins as all the stress and vibrations caused by other screens are absent.

* * *

COAL

If you've been to Denniston
and climbed the winding hill
it's easy to imagine
that the mines are working still,
that houses have not tumbled down,
that children call and play
around the school and in the park
on every summer's day.

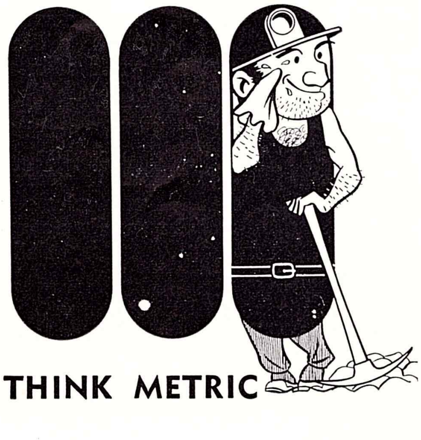
But no one lives in Denniston
and no mine works, bar one
and everything is overgrown
and sleeps beneath the sun.

But when the mist is rolled away
on any starry night
across the curve of Denniston
you'll see a blaze of light
and know that they are there again
and coal is booming still,
in Denniston, in Denniston
high on a windy hill.

But people who were never there
will tell you that you mst take care,
imagination stirs and pricks
and plays a lot of funny tricks.

Peggy Dunstan

* * *



Changing scene of mining . . .

Artist Jack Crabtreet had never been down a pit, but he "starred" in an art exhibition in London sponsored by the British National Coal Board. And now he's going underground to paint miners at work.

"I'll be spending about 12 months capturing coalfield life on canvas for the board," said Jack, whose oil paintings shared top billing alongside ex-miners and miners' sons' works, in a week-long "gallery" at Hobart House, the first of its kind by a major industry.

He began painting collieries and pit people six years ago. Then he applied for a Fellowship to take time out for a year to paint the industry's changing face.

"I contacted Hobart House about my plan, and when asked if I would do the work for the board, I just jumped at the chance," he added. "I've painted pits before but never had real access to them. Now I've been given an opportunity to go with the miners."

The exhibition, featuring 30 artists, was first mooted by Industrial Sponsors, an established charity, and said organiser David Brown of the Tate Gallery: "We've broken new ground in getting a nationalised industry to sponsor an exhibition."

ART AND INDUSTRY

He explained: "As a result of research we have found that life is becoming even harder for creative artists in this country . . . only a small number of gallery owners are willing or able to exhibit the work of new or little known artists.

"If, as many of us believe, artists are an extremely valuable section of the community, more effort is needed to support the arts. That's why our aim is to obtain wider public appreciation of the visual arts, especially in working environments."

WIDE RANGE

The exhibition showed a selection from the Elemore union banner and the Ashington Group from the North East — a group of artists, mainly miners, formed in 1934 whose only surviving founder member Oliver Kilbourne, a retired underground salvage worker, had one of his works on view — to small paintings of mining village life by ex-pitman Herbert Cooper and works by Henry Moore.

Added Mr Brown: "The interpretations were various . . . narative, romantic, even lyrical . . . but all hinged on mining reality." — British "Coal News".

☆ ☆ ☆

UNDERGROUND WARFARE

"There are no windows in a mine — you can't look out or call out," Jim Henderson, Nelson-born writer and broadcaster, with eight books now selling simultaneously, reminds his readers in a new, lavishly illustrated coffee-table book "The New Zealanders", from Millwood Press, Wellington.

Asking people at least not to criticise miners until they've been down a mine, Jim tells of when deep underground, at crib time, two West Coast miners, pacing side by side, hove into sight in hot argument.

"And what about Bannockburn?" exploded one.

"Ha yes! And what about Culloden?" replied his comrade, "and you've never lifted your black heads since!"

And they disappear still arguing.

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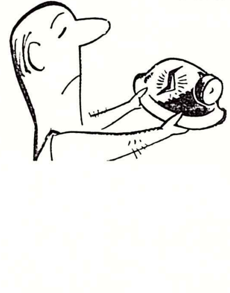

WEAR YOUR HELMET !

BORSCH

"I enclose the recipe for Ukrainian Borsch," writes Mr F. W. Munden, Project Manager at Huntly.

"It is one of the Ukrainian dishes," he says. Mr Munden visited the Soviet Union last year. "I had this soup in Russia and liked it."

For gourmets in the coal industry, we offer the recipe, translated into English by Mr Munden's interpreter during his visit:

Prepare meat broth and strain it (to filter it).

Cleaned culinary herbs and beetroot to be cut in straw.

Stew beetroot for 20-30 minutes, adding some fat or lard, tomato puree, vinegar and some broth.

Fry a little culinary herbs, an onion with butter, mix them with fried flour, then mix them with some broth and bring the mixture to the point of boiling.

Put potato, cut into cubes, in the broth, and put in cut cabbage into the broth with stewed beetroot, and salt. Boil for 10-15 minutes, then add the culinary herbs fried with the flour, laurel leaf, bitter and sweet-scented peppers, and boil up to the moment when the potato and cabbage are ready.

Add to this ready Borsch pork fat spread with garlic. Add cut tomatoes. Boil rapidly and leave to stand 15-20 minutes.

When pouring into plates, put into the Borsch a spoonful of sour cream, and strew the Borsch with parsley cut fine.

Ingredients:

500 g meat
400 g cabbage
400 g potatoes
250 g beetroot
100 g tomato puree
100 g sour cream
1 pc onion
1 spoonful of butter
20 g pork fat
1 pc of each culinary herb

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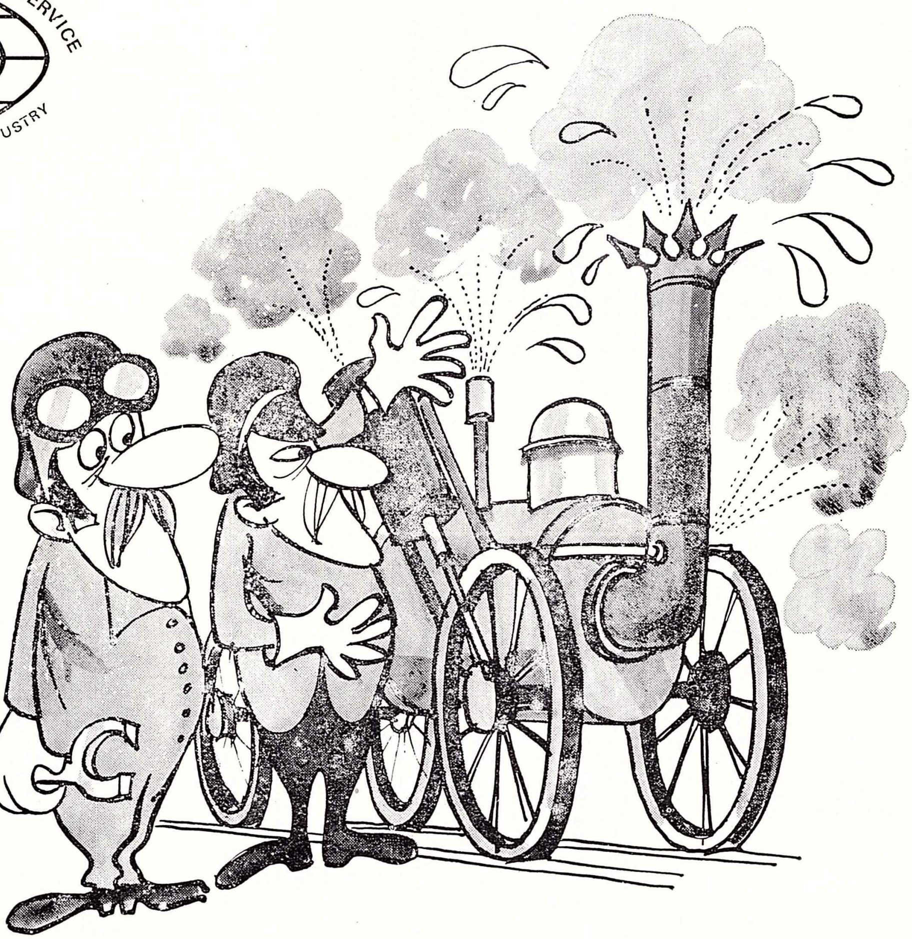

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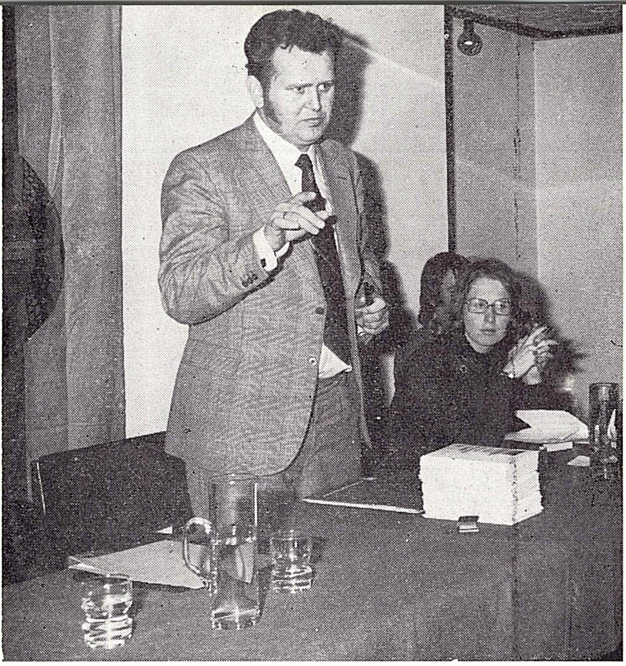
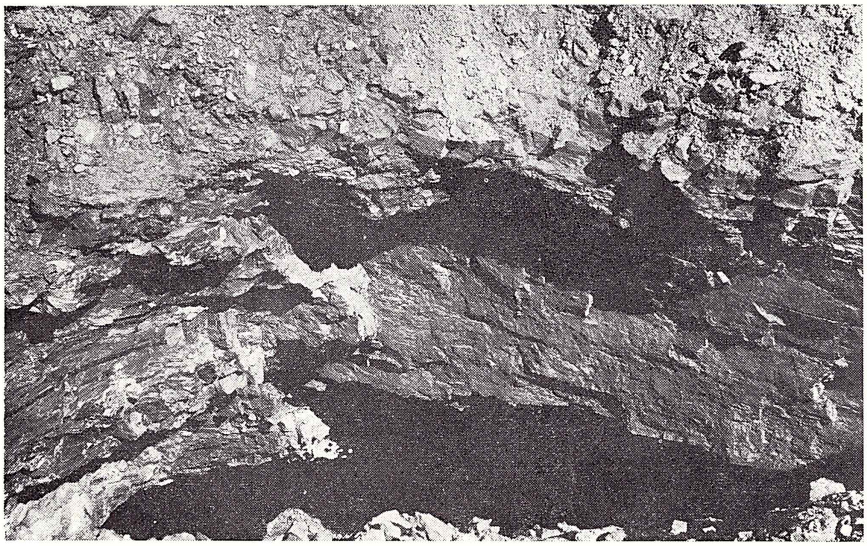
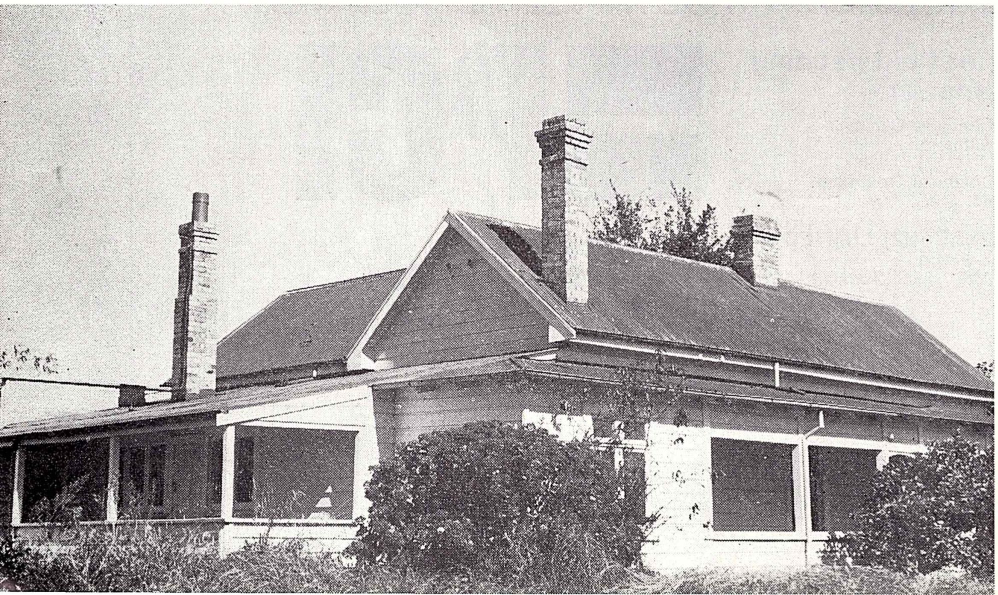


Dr Eng. Guenter Seifert, of the German Democratic Republic, speaking at a two-day symposium in the James Cook Hotel, Wellington, on April 14 and 15. The subject was "Mining, Processing and Utilisation of Lignite". The German Democratic Republic mines 247 million tonnes of lignite annually from opencast mines. As the biggest lignite producer in the world, the Germans were informing New Zealand interests about their mining methods and the uses of the lignite in their country.

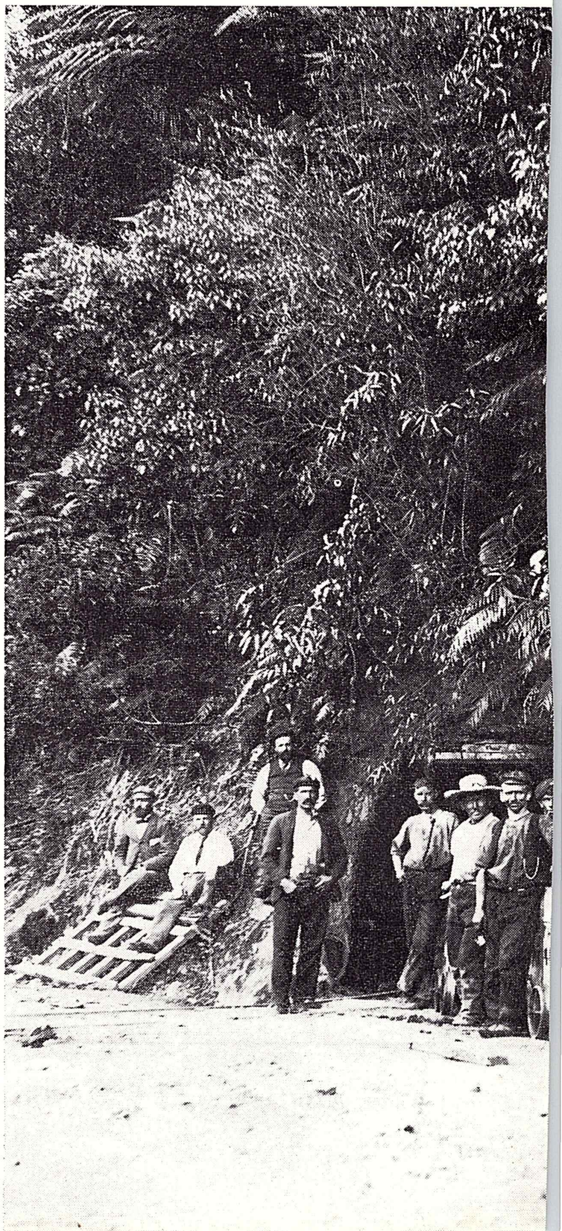
Opencast operations at Kimihia uncover old underground workings. This tunnel was part of the workings where coal was extracted about the time of World War I. The Kimihia workings took coal from under a lake, which was subsequently drained to allow opencast mining to recover vast amounts of coal untouched by the underground method.



Once the residence of coal mine managers at Huntly, this house, which had become the property of the Mines Department, has been given to the Huntly Historical Society. The society can use the building as a museum, a condition of the gift being that the home must be moved to a site away from its present setting.



From the Collis Collection at the Alexander Turnbull Lib
the mid 1890s. The mine was the Mokau No. 1, also know
but not identified, are the manager from 189



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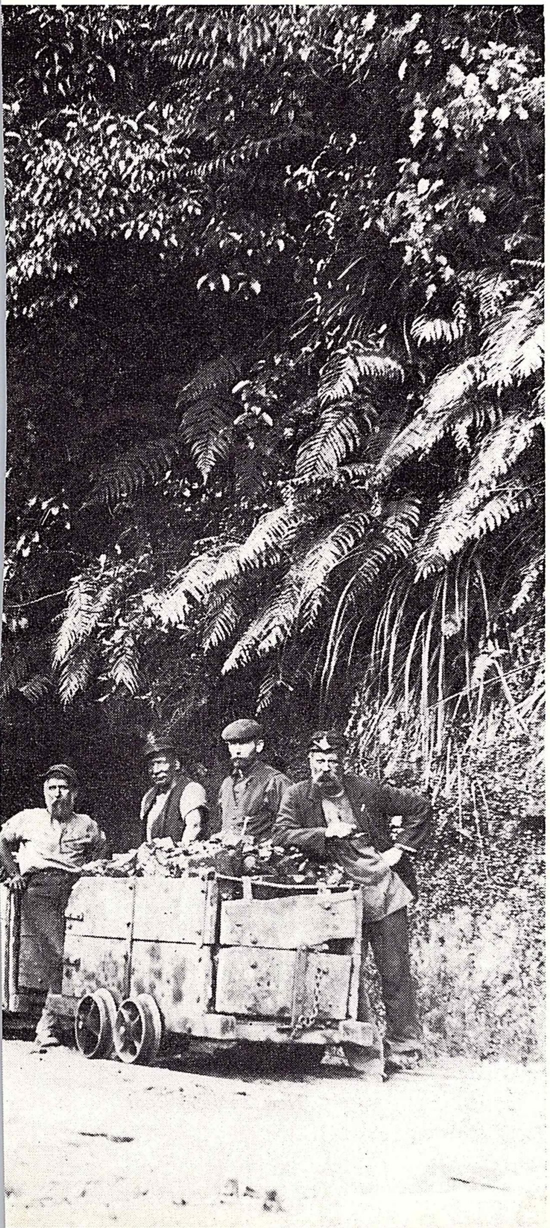
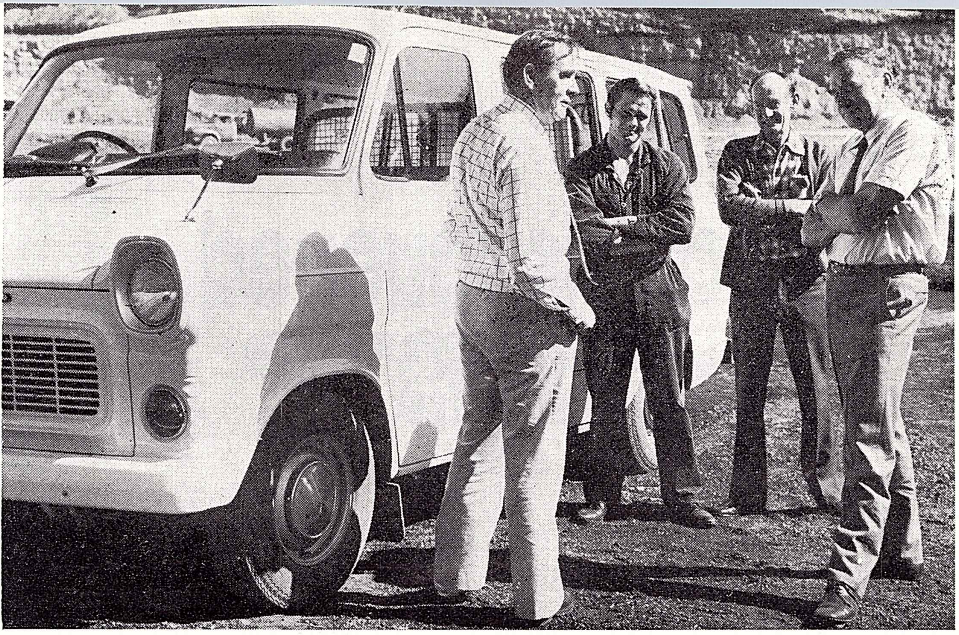
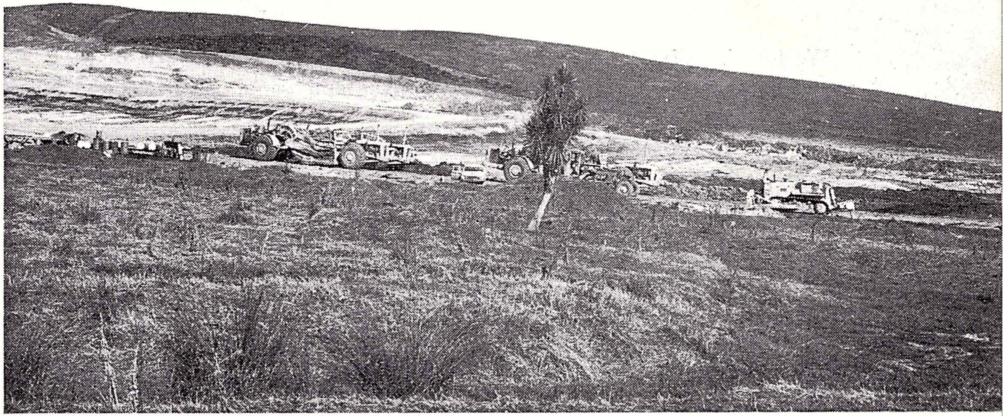
ry comes this photograph of coal mining in Taranaki in as Maryville or Mangapapa. Included in the photograph, to 1898, Joseph Labb, and a Captain Jensen.



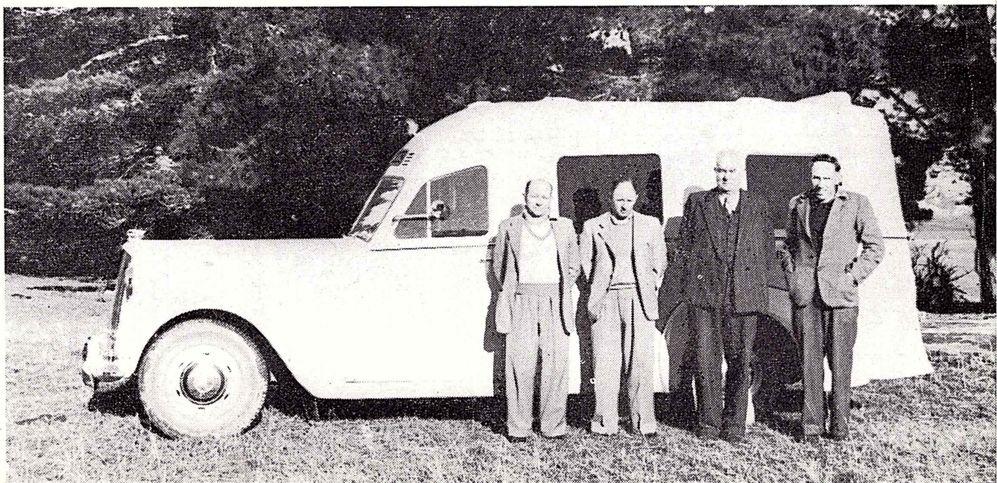


Coal mine safety for coal miners their concern: the Chief Inspector of Coal Mines, Mr T. Brazil (left), discusses with other safety officials a new and different form of rescue van which was tried out at Rotowaro. Continuing from left, the others are: Messrs R. W. Hawke, Officer in Charge, Rescue Station, Huntly; W. Ireland, Superintendent of the Mines Rescue Brigade, who is stationed at Ngakawau and R. A. Andrews, Inspector of Coal Mines, Huntly.



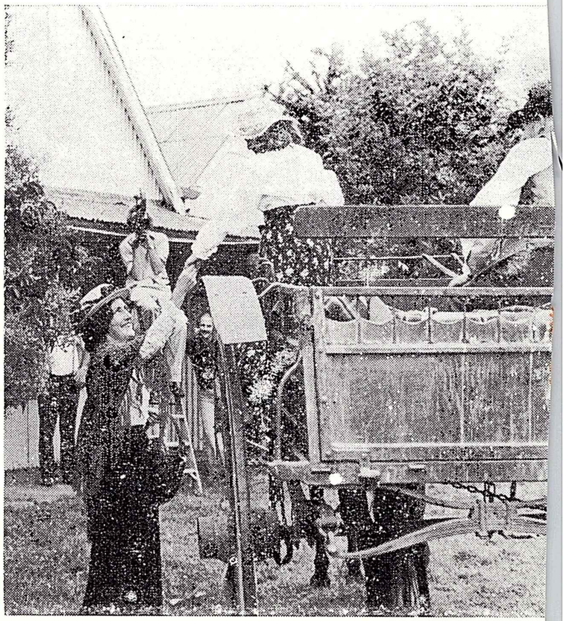
Responding to the continuing and expanding need for coal for the North Island, the Mines Department has begun developing new opencast workings at Rotowaro. Earthmoving machines were hard at work removing overburden at Maori Farm when "Coal's" photographer passed by in April.

This old photograph of an ambulance at Ohai recalls the sterling work of volunteers in maintaining the service. From left to right, the people are Messrs A. and J. Thomson, J. T. Moseley and W. Elliott. Mr Moseley, who worked long and faithfully for the ambulance service, is now retired and lives in Christchurch, and the Thomson brothers have since died. Mr Elliott still continues as secretary.



coal discovered easter 1974?

— A century or so after Rochfort but none the less exciting for someone city born and bred. Our trip to the Coast that Easter ended with my husband and I determined to make a 16 mm colour film about Denniston. I had joined an amateur film-making group about two years ago and we'd reached a point where we felt someone must organise a film to involve keen members. Fortunately the group, "Alternative Cinema", has among its members several professional film makers who worked for the NZBC. My husband and I are most grateful for their help, particularly Max Quinn our cameraman, who never tired in his efforts to follow the script in every detail.



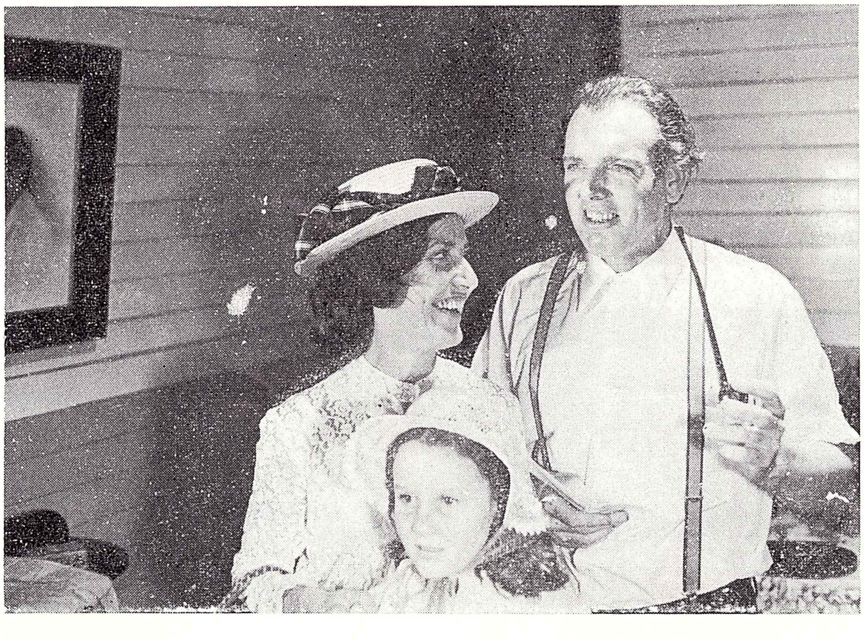
Cameraman Max Quinn films Pat Hunter (old man's wife in Flashback scene), Elizabeth Williams (little girl) and Ralph Bowler (owner of the trap). Mr Pollett, who helped by allowing the use of his property, watches in the background.

Westport's climate had been its usual mild self, so much so, that we'd spent our time enjoying the subtropical countryside, instead of looking for a reasonably priced holiday cottage (the original reason for our trip from Christchurch). Unfortunately the only Coast property we managed to look at was in Granity where the land belonged to the Railways and could never be our own....

DENNISTON

Previously coal was simply something we bought from the yard and when my husband suggested we break our journey home to "nip up to see Denniston", I must confess a feeling of irritability overtook me, for I hate the "getting there" part of travelling and make as few diversions as possible.

What the cameraman saw through his camera is what the audience will see: Pat Hunter, Paul Parkyn who plays the old man, and Elizabeth Williams as the little girl, in a flashback scene of the old man when he was in his prime as a coalminer.



We'd no idea that several months later we would be driving up that same hill with our small crew, Max Quinn (camera), Carol Quinn (production assistant), Pat Hunter (woman in film), two cars full of equipment, camera, tripod, lenses, makeup, etc., plus my script, all ready to begin filming. Unfortunately our editor, Simon Sedgley, had to work and could not make the Denniston trip.

Looking back towards the sea from the winding road up to Denniston, the entrance to the harbour that caused so much trouble around the turn of the century could be seen. The only way out for the coal was by rail to the Westport docks. In those early days the continued extraction of the coal depended on the bar and the mood of the river. If the bar could not be navigated the coal would build up on the limited dock area and put the miners out of work until the conditions improved. Today, although major improvements have been carried out on the harbour approaches, one of the main difficulties still facing the coal industry is the high cost of transport.

As we approached the top the scattered ferns that had promised something on the lower section gave way to barrenness and sub-alpine scrub. Chimneys stood lonely against the sky on either side. Rotting boards lay nearby, with battered sheets of tin poking through the rubble — bleak, grey and dead.

POTTER

Paul stopped the car at the top, jumped out and headed towards the edge of the boarding. We had left the warm lowlands and the wind was cold. In the back of my mind i knew Paul would potter about for ages. That's Paul. The bleakness of the place settled over me as I waited. Gentle pictures of life now gone overtook my impatience. I could see the houses standing once more.

Ignoring the cold wind, I left the car and stood beside Paul overlooking the slopes of Mount Frederick where we have since learned that the Koranui coal mining town once flourished in the early 1900s.

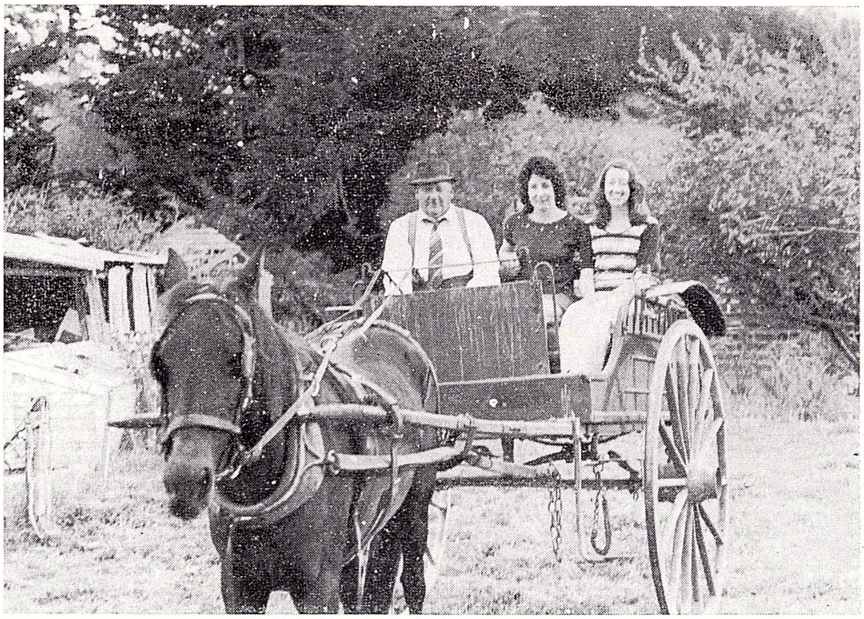
It was unbelievable. Nothing left at all. Only a scar on the hillside.

DESERTED

I looked back to the Denniston works below. The sheer starkness of the view . . . the old machinery and iron that was visible now that I'd reached the top . . . the size of it lying twisted, gaunt and rusty against the deserted plateu area . . . I could not find words to describe the scene.

There was a world below that I and thousands of others had been ignorant of — a hard land that once had strength and vitality. Here was a world born of coal — and looking towards the twisted rails, the stark chimneys and upturned coal buckets — a world killed by coal. The size of the wheels and machinery brought a sad shiver to me as my eyes tried to visualise the town as it once was.

We spent an hour wandering quietly through the remains. Coal, for once in my life, meant something. Paul and I decided there and then to forget about buying a cottage on the Coast for a few years and to use our savings to make a 16 mm colour film about Denniston before it was competely gone, like Koranui across the hill and Burnett's Face two miles further on.



Mr Ralph Bowler takes Mrs Parkyn (centre) and Mrs Quinn for a ride in the trap after a film sequence.

RESEARCH

Through my research I had learned that a large proportion of the West Coast railways owe their existance to coal and timber. The early Mount Rochfort railway was built from Westport to Waimangaroa about 1874 to 1876. As improvements were made at the Buller River loading area the rail was later extended to Ngakawau.

Pharlap, horse and trap, deserted mining villages? — Contrasting with modern, efficient coal production at Stockton, the past of coal in the difficult days of West Coast mining have been re-created by an amateur film-making team.

Mary Parkyn writes for "Coal" about the film she and her husband and willing friends have made to record the human side of coal mining as it was once, before changes in techniques and better human conditions have erased memories completely.

We decided to make the film a dramatised documentary with flashback scenes depicting the life of Denniston over the years. The film lightly covers the birth of Denniston from the time when Rochfort, Haast and Burnett first discovered coal in the area. We were very fortunate in obtaining information about the mines and incline from Bill Miller of Ngakawau. Bill also gave us several other addresses to write to for possible information.

LIGHTER

There is a simple story running through the film to add a lighter side. The story is seen through the eyes of an old miner, now about 80, spending his last days on Denniston. The story, through flashback scenes, shows periods in the old man's life. One scene recreated in Christchurch, shows the arrival home of the old man's wife (played by Pat Hunter). We had a lot of trouble in acquiring a horse and trap for this scene. Fortunately a friend of my husband's noticed one lying in a creek near Springfield. After inquiring, we found the owner, Mr Ralph Bowler. He had just taken it out of a shed to swell the wheels in the water. From that lucky encounter, we had a horse (Gloria), trap and driver for our film. We would have had more problems if the property next to Mr Bowler's had not belonged to a very obliging city land agent (Mr Pollett). He let us use the cottage to film the first flashback scene.

The thought of a horse bolting down a busy road in central Christchurch almost led us to omit that particular scene, so we were most grateful to Mr Pollett and Mr Bowler for their help.

". . . . Looking back towards the sea from the winding road up to Denniston . . . .

More than half the film has been shot on location in Denniston and surrounding areas. Another flashback scene shows a little of the effects of strikes during the depression years. The Christchurch City Council was most helpful in allowing us to use an old cottage scheduled for demolition, to build the bar room set for the scene. Members of alternative cinema and friends helped out by lending clothes, old furniture of the era, etc. Ballins' Breweries lent an old wine barrel cradle and the Canterbury Jockey Club lent a photo of Pharlap for us to have copied for the bar room. Although lasting only a few minutes each, these two flashback scenes took a great deal of organising and time.

SCREENING

The final scene symbolises the end of life for both Denniston and the old man. If the film, titled "Ghost Town", is not shown commercially, we intend arranging a private screening for anyone interested in seeing it. We shall advise "Coal" magazine when and where the film can be seen. However, it will be several months before it is complete.

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The boiler may be inspected at the old Heretaunga Dairy Dairy Company factory, Stortford Lodge, Hastings.

For further particulars please contact our Production Manager, Mr. R. S. Jones, Telephone 8458, Pahiatua.

HUNTLY COAL BUNKERS

A $3,800,000 contract has been let to New Zealand Structures Ltd, of Christchurch, for the supply, fabrication, and delivery of 5000 tonnes of steelwork for the Huntly power station, the Minister of Works and Development, Mr Connelly, has announced.

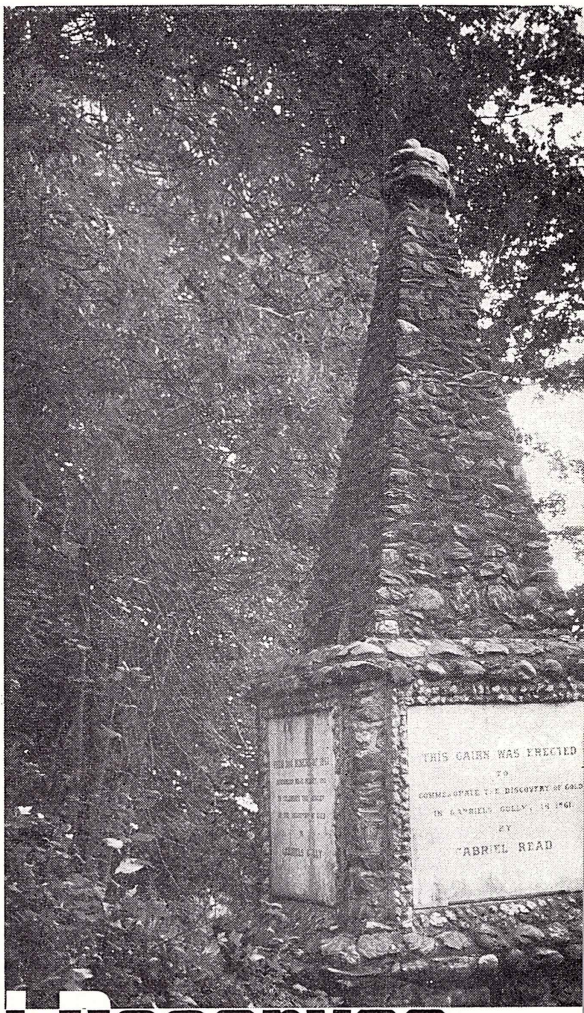
The steelwork will form 16 bunkers which will each hold up to 500 tonnes of coal for feeding to the station's four boilers.

FILMS ON METRICATION

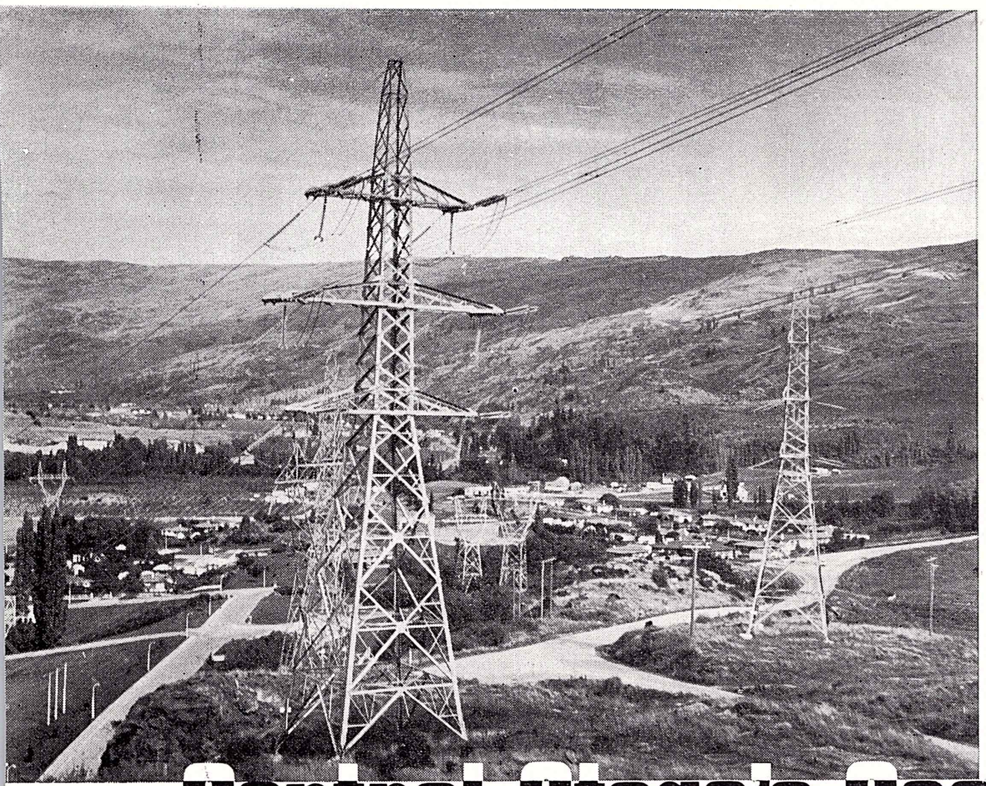
A list of 13 films on metrication has been published by the Metrics Advisory Board. The films cover various aspects of the change to metrics, affecting industry and personal life.

The list is published as Metrics Advisory Board circular No. 36 (postal address: P.O. Box 10-243, Wellington).

The films are available free to established organisations from the National Film Library, and Wellington, Auckland and Christchurch addresses of the library are published in the circular.


THIS CAIRN WAS ERECTED
TO
COMMEMORATE THE DISCOVERY OF GOLD
IN GABRIEL'S GULLY, IN 1861
BY
GABRIEL READ

Gabriel Read began it: this memorial commemorates the man who found gold and started the goldrush to Central Otago. He was indirectly the cause of beginning a coal industry which has used 1,429,686 tonnes of the local coal in the area.



Roxburgh, famous for its fruit, now also famous for its massive hydro electric station, has had its own coal mines since 1864.

Central Otago's Coal Reserves Can Provide Cheap Fuel Alternative

Renowned as New Zealand's "hot-spot" in summer and the coldest in winter, Central Otago is known otherwise for its fruit, its hydro electricity and — until the advent of 1080 poison — its rabbits.

Less well known is that Central Otago once produced large amounts of coal and that considerable quantities are still in the ground awaiting future use.

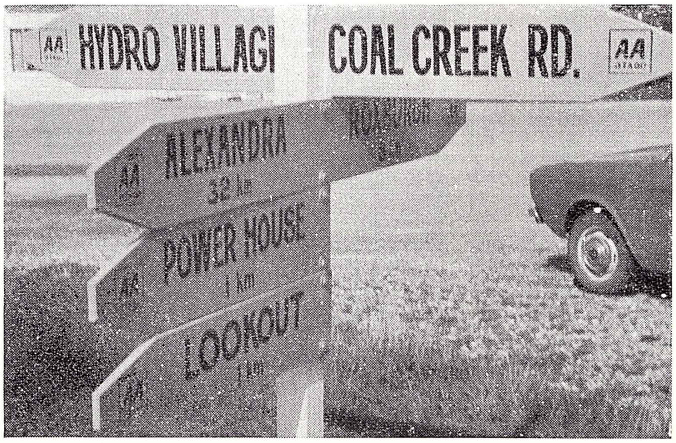
Gold lured early Europeans into Central. But the tough winters and lack of firewood in an area which averages 11 inches of rain a year created a demand for fuel. Transport over unformed roads in the 1860s put a premium on imported goods and the pioneers turned eagerly to the prolific deposits of coal.

Central's lignite is of high quality, and creates interest today for its montane wax potential. But to the early British, accustomed to the free-burning bituminous coals of the old country the lignites were not highly rated.

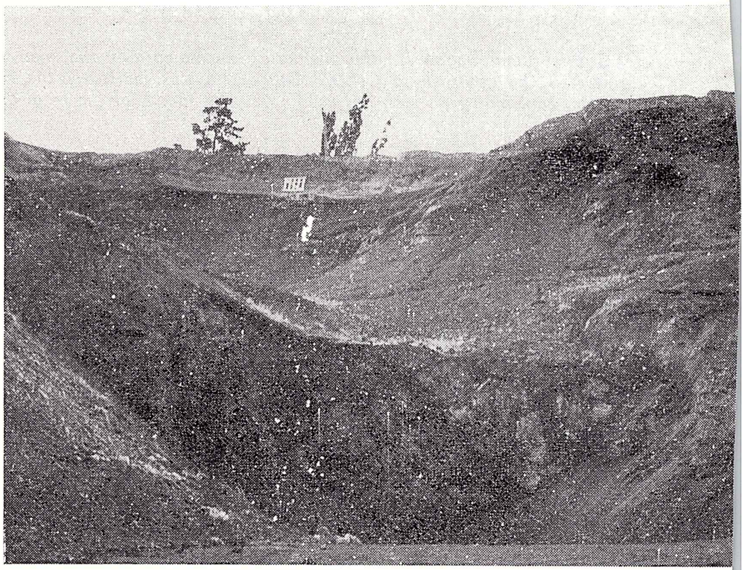
New Zealand's coal industry knows better today the worth of the country's lignite deposits. New appliances — domestic and for light industry — are readily available to exploit the advantages of lignite which is right to hand with low transport costs, providing cost advantages against imported fuels and high-demand electricity.

GOLD

Gabriel Read began Central Otago's history when he discovered gold in 1861. This lead to New Zealand's



Alternative power: Roxburgh options.



The 20-to-23-metre seam of coal mined by the Harliwichs at Roxburgh has about 30 metres of overburden. The low-sulphur lignite is of high grade, approaching sub-bitumous rank.

first goldrush, and the goldfields which developed throughout Central Otago paved the way for later, more stable industries in sheep farming, orchards and tourism.

Now that New Zealand has a growing need for energy, electricity is becoming another major product of Central Otago — using the hydro power of the Clutha, the country's largest river.

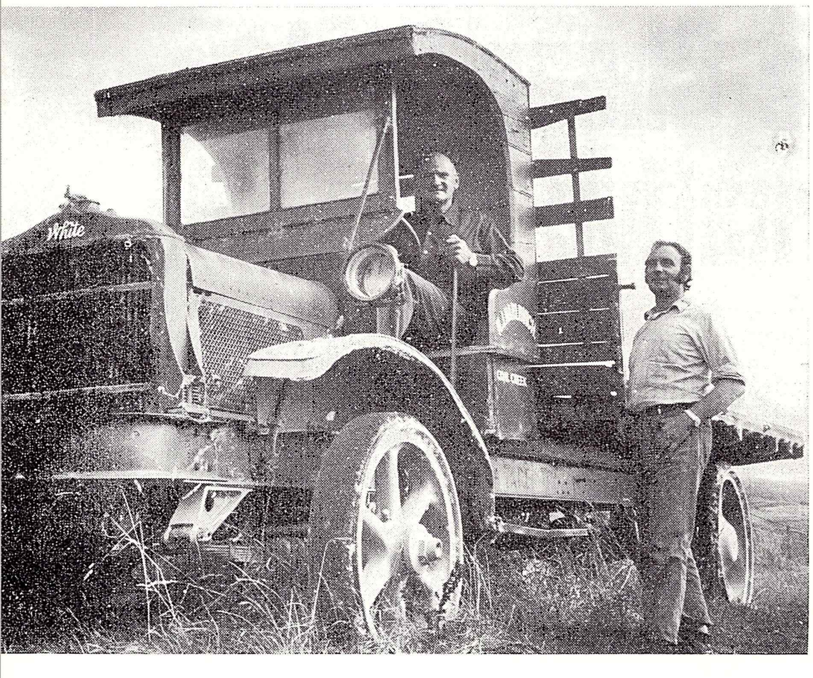
Roxburgh, 151 kilometres from Dunedin, is well known for its fruit, and also for the dam across the Clutha which, begun in 1949, generates 320 megawatts of power.

Perhaps less well known is that Roxburgh has sustained coal mining for more than a century, from a seam of high-grade lignite, slightly better in quality than the other Central Otago lignites.

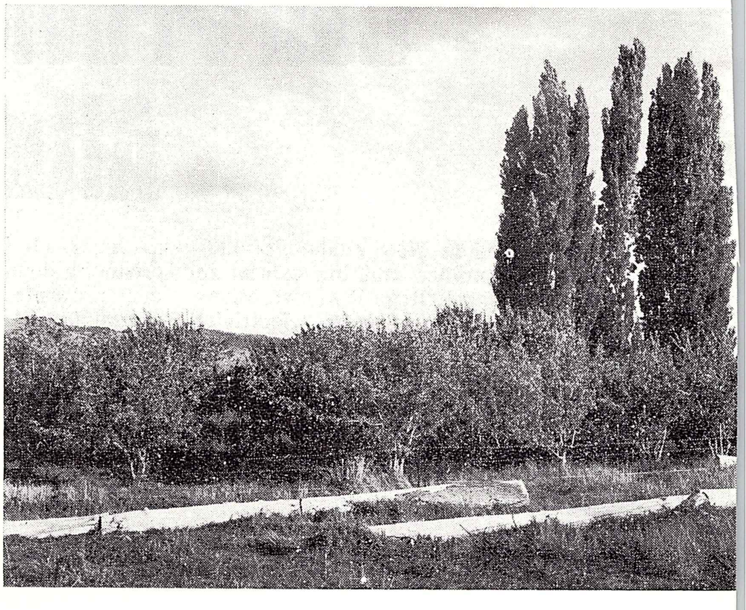
LOW SULPHUR

The lignite is low in sulphur, and the late Dr R. W. Willett, of the Department of Scientific and Industrial Research considered that if an average seam thickness of 32 metres were assumed, there were about 3,000,000 tonnes of which half a million tonnes could be opencasted.

Mr N. J. Harliwich bought two petrol lorries — with tubeless tyres — for coal deliveries in 1918, two years after he took over the Roxburgh coal mine. The dry atmosphere in Central Otago, where temperatures reach 38 C in summer and fall to -18 C in winter, allow iron and steel to remain indefinitely with little rust. This surviving lorry is in going order, and Mr E. J. Richards, Inspector of Coal Mines at Dunedin, tries the seating to experience what post-World War I lorry drivers had to contend with. Mr Ken Harliwich, mine operator, looks on. The lorry carries the name plate of the suppliers, Newton King of New Plymouth, a large firm still active in the North Island. The vehicle has four forward gears — the last reduction being a planetary drive in the hub to reduce the strain on the drive.



Roofed in coal. This orchard at Alexandra, just relieved of its crop of juicy pears, grows over old underground coal mine workings.



McPherson's Pit, which began in 1871, has produced to date about 200,000 tonnes.

Today the mine is operated by Ken and Roger Harliwich, whose father took over the mine in 1916. The brothers began managing the mine in 1956 and run it in conjunction with roading, irrigation and carrying businesses.

While most of the production is for domestic use, a fruit preserving factory at Roxburgh and some hothouses use the coal industrially. The factory uses about eight tonnes a day for two or three months during the fruit season.

"They find it most economical," says Ken Harliwich.

The brothers' grandfather arrived at Roxburgh in the 1870s to work on gold dredges. Then the coal was mined underground and as well as being used domestically powered the dredges then operating.

When Mr N. J. Harliwich bought the mine in 1916 it was on fire underground and he introduced opencast working by sluicing the overburden away.

"Trade should come back," says Mr Ken Harliwich, who has just returned from a visit to the USA to see new earthmoving equipment for use in the mine and for their contracting work.

Rises in the cost of other fuels will inevitably turn many people back to relatively inexpensive local coal, especially now that modern appliances can use coal so much more efficiently.

DEPOSITS

Most of the centres of present settlement in Central Otago have coal deposits, some of which were worked intensively in past years. Alexandra, an expanding town, is surrounded by many old underground workings. Orchards are now flourishing above them and the mines come back to mind only when new road developments come close to running over old workings which might affect the strength of the highway for modern traffic.

"Lignite-bearing measures lie along the Bannockburn Valley and in the Cromwell depression, and also appear as small isolated in-faulted strips in the ranges through which the Kawarau River runs," wrote the late Dr Willett.

The Gibbston Mine closed only recently. At an elevation of 700 metres, this mine is just off the tourist highway between Queenstown and Cromwell.

Coal mining leaves almost no traces of the vigorous underground workings which once won coal for Central Otago. Occasional depressions over the old tunnels, and the remains of a mine shed wall, at this abandoned mine near Cromwell are the only traces left in this fertile farm country.

The tourists who travel the road are more likely to watch the splendours of the Kawarau Gorge — soon to be exploited for electric power generation — while another form of energy remains in the hills above them.

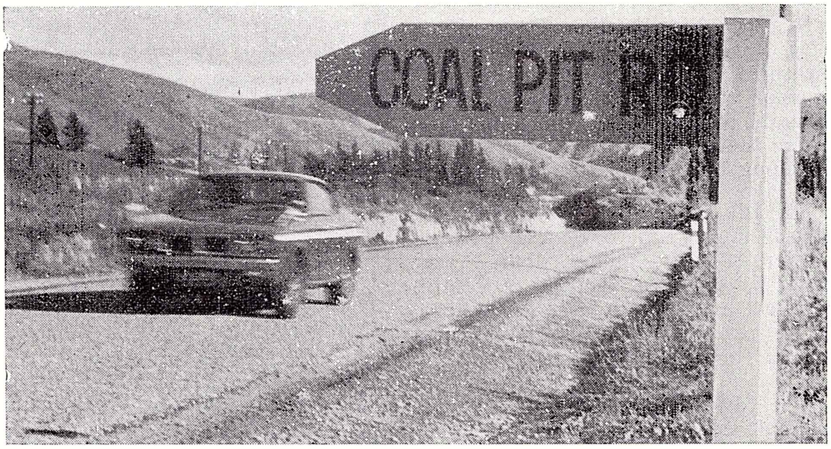
The mine at Gibbston was originally worked underground to supply Queenstown and Cromwell. It opened in 1887 and until the underground workings closed in 1932 produced 30,000 tonnes of high grade lignite. The high elevation enabled the coal to be transported by gravity by a tramway to the main road.

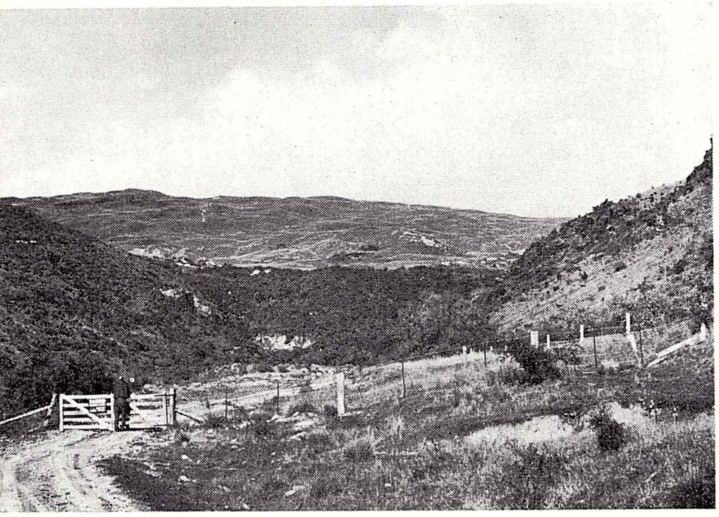
Opencast workings were opened in 1968 but stopped four years later.

CROMWELL

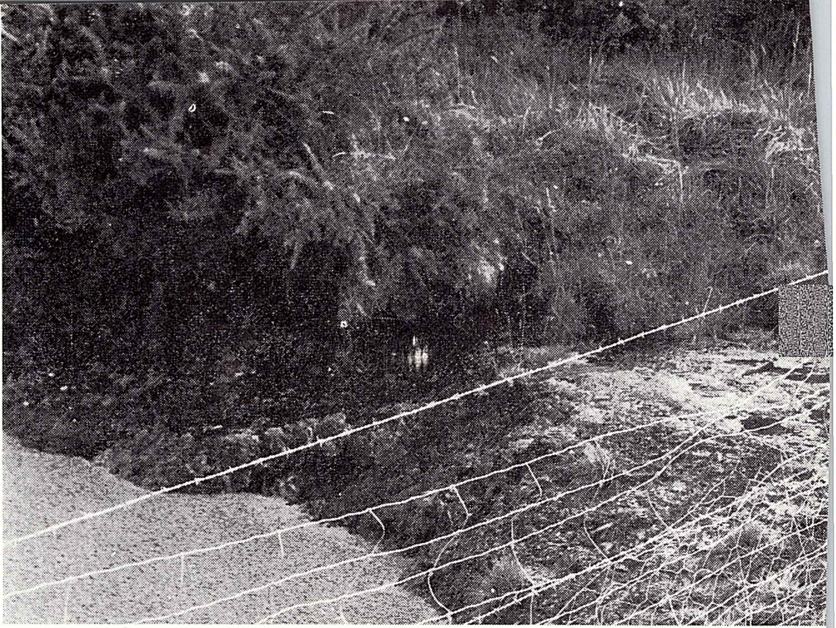
Eight kilometres from Cromwell the scars of gold sluicing remain. The traces of coal workings which closed only 20 years ago, however, are not so obvious. The ground above is cultivated farmland, only the wall of a mine building still standing, or a solitary abandoned box lying in a field.

Looking the other way from Kawarau Gorge between Queenstown and Cromwell towards the coal-bearing hills.





Coal has been mined in the Gibbston-Nevis area since 1868, and production from opencast workings ceased as recently as 1972. Considerable amounts of coal remain.



The coal seam, less than a metre below the surface, can be seen in this waterlogged pit at Oturehua.

St Bathans, some 66 kilometres from Cromwell, was the home of 2,000 people at the turn of the century. Today the dredge tailings remain to show where gold was won. The Vulcan Hotel, maintained as close to its original state as modern standards of hygiene permit, still services the local farming community and tourists.

Coal was worked in the adjacent Cambrians from 1862, the last underground mine closing in 1949, and some opencast workings continuing until 1960.

QUANTITIES

About 100,000 tonnes of coal were won in the area for domestic use and to power the gold dredges. Considerable quantities of coal still remain.

The seam dips away and its extent is not known as it goes deeper. Further on large areas are thought to hold coal.

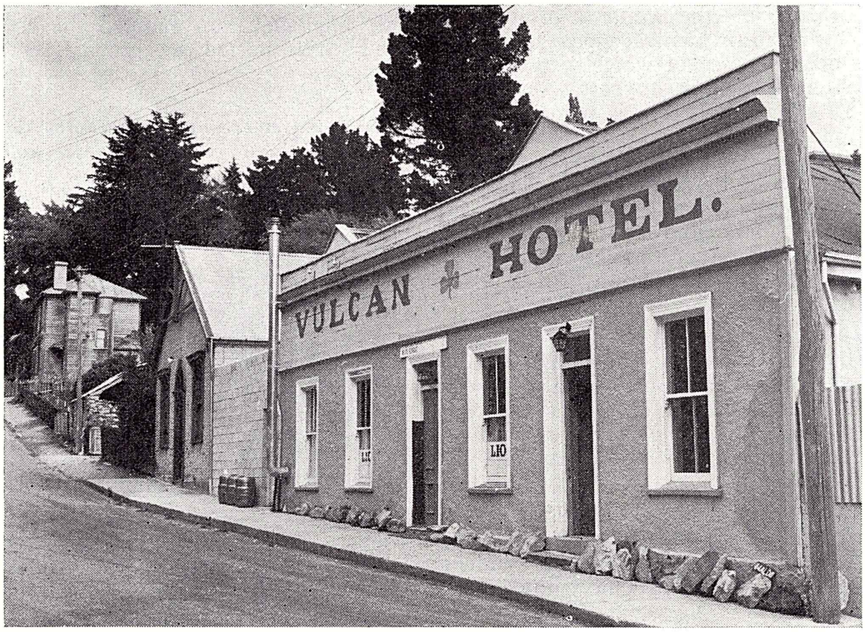
In the Manuherika Depression, near St Bathans, lignite-bearing measures occur throughout the depression and have been worked at several places along the margins where the measures have been drawn up along the upthrust schist blocks.

The Ida Valley has six to 14 metres of coal under a metre or less of overburden. The lignites there are generally either flat-bedded or gently inclined, and it is thought that there is no reason why they should not extend for great distances.

The Idaburn opencast mine is still worked occasionally to supply coal to

TONNAGES OF COAL FROM CENTRAL OTAGO AREAS	Tonnes
Roxburgh area, from 1864 and still producing:	329,708
Alexandra-Clyde area, from 1872-1927:	367,907
Cromwell-Bannockburn area, 1872-1956:	328,260
Gibbston-Nevis area, 1868-1972:	91,430
Crown Range area, 1862-1960:	27,389
Cambrians-St Bathans-Blackstone Hill areas, 1862-1960:	108,465
Oturehua-Idaburn-Wedderburn-Kyeburn areas, 1871 and still producing from Idaburn	176,527
Total	1,429,686

The Vulcan Hotel and a few other dwellings at St Bathans are the only reminders of the 2,000 goldminers who once used local coal in their homes and gold dredges.

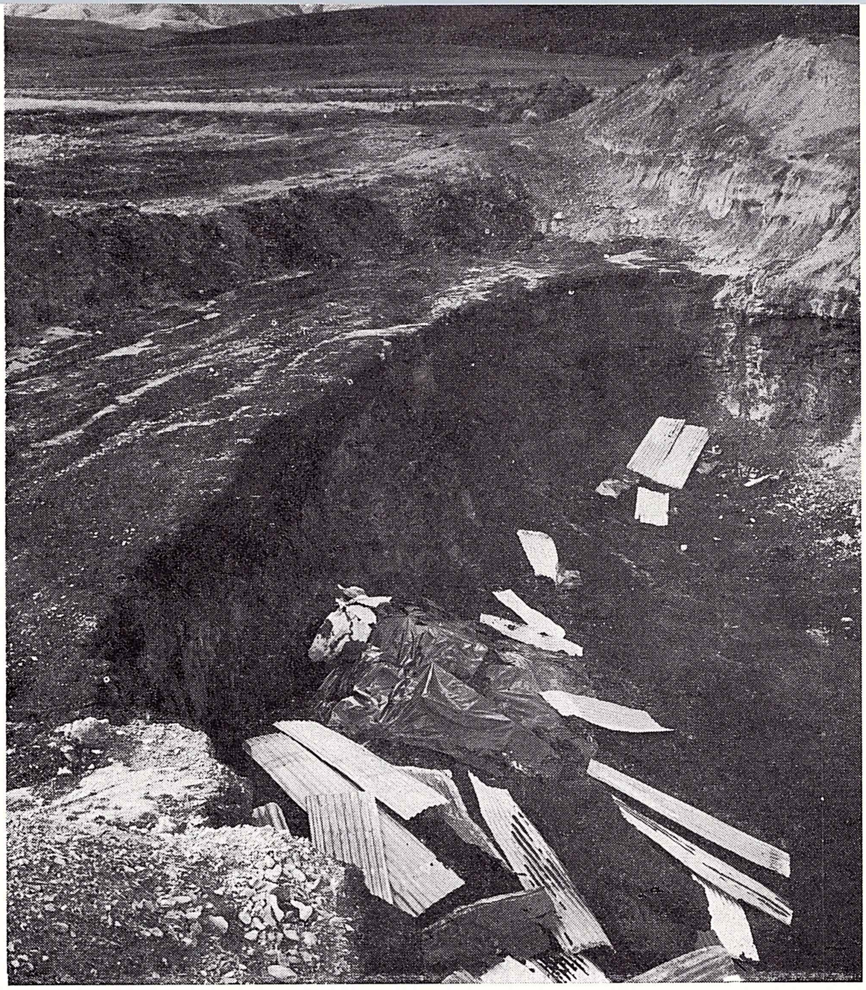


Ranfurly, 16 kilometres away. The six-metre seam has an overburden ratio of 1:1 and less, and has been worked since 1871.

"Central Otago has a lot to gain from using its local coal," says the Director of the Coal Research Association, Mr P. A. Toynbee. "We have efficient appliances now which work well on lignite like Central Otago coal.

"Appliances for heating motels and hothouses and homes are now on the market in New Zealand," he says.

"I foresee a resurgence of coal in Central Otago, once the economy of coal and the efficiency of modern coal appliances are realised there."



Ranfurly is still supplied with coal from this pit, 16 kilometres away from the township.

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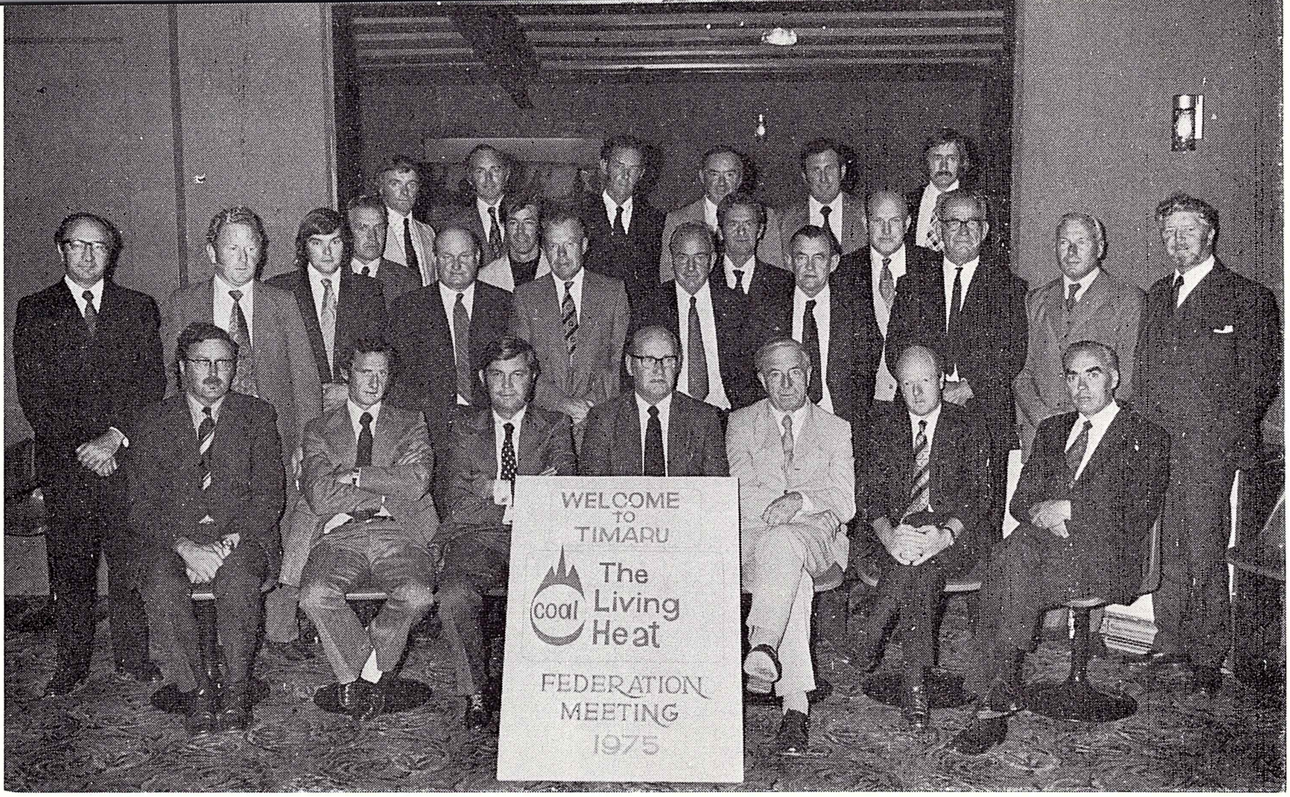


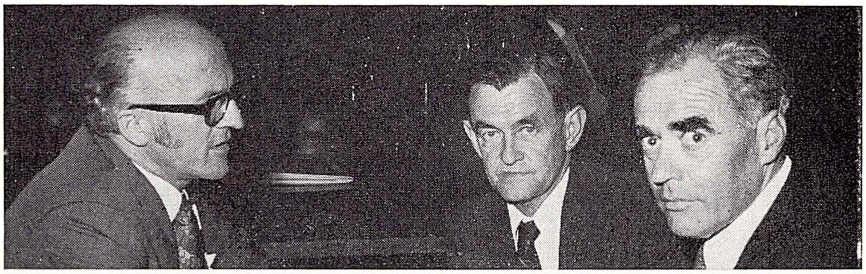
South Island coal merchants and others in the coal industry assembled at Timaru for a serious session on the industry's future challenges. In the front row (left to right): Messrs K. Haywood, secretary, N.Z. Coal Merchants' Federation; K. Sullivan, retiring president, Federated Coal Merchants; Mr B. Bergin, president, Coal Merchants Federation. S. Armstrong, president, N.Z. Coal Merchants; F. J. Murray, secretary, Federated Coal Merchants; J. Smith, Head Office Sales Manager, State Coal and P. A. Toynbee, Director, Coal Research Association.

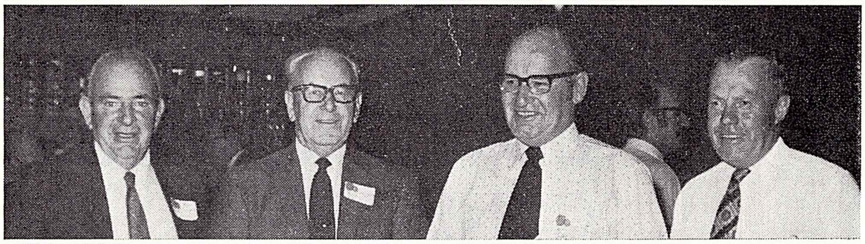
SOUTH ISLAND COAL MERCHANTS PLAN FOR ANOTHER YEAR'S ACTION

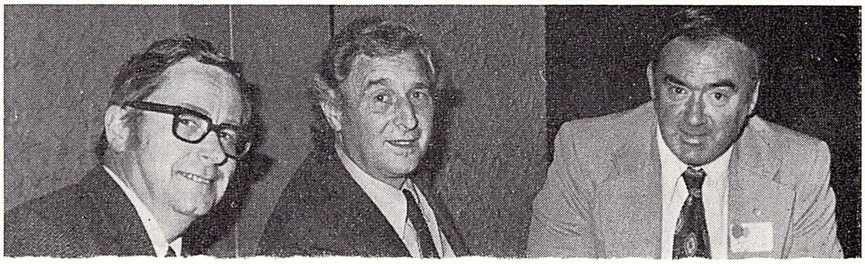
The manager of the State Coal Depot at Christchurch, Mr S. Armstrong was elected president of the Federated Coal Merchants (South Island) on April 8.

The merchants were holding their annual general meeting at Timaru and discussed licensing of coal merchants, export of Mt Davy coal, and domestic appliances suitable for meeting the requirements of the Clean Air Act.

Mr I. Stanley, of Timaru, was elected vice-president of the Federated Coal Merchants. Mr K. Sullivan, the retiring president, did not seek re-election.





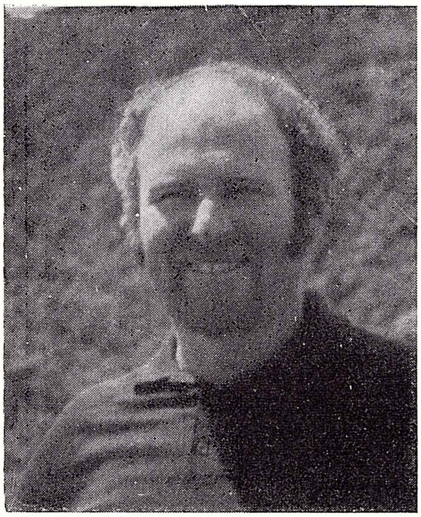


(Top right): User-seller-advisor get-together at the South Island Coal Merchants' meeting at Timaru. Business done, Messrs Ron Guthrie (N.Z. Insulators Ltd, Temuka) on the left; Mr Ivor Stanley (Canterbury Farmers' Co-operative Association, Timaru) in the centre and Mr P. A. Toynbee (Coal Research Association, Wellington) relax in the pleasant atmosphere created in the coal industry.

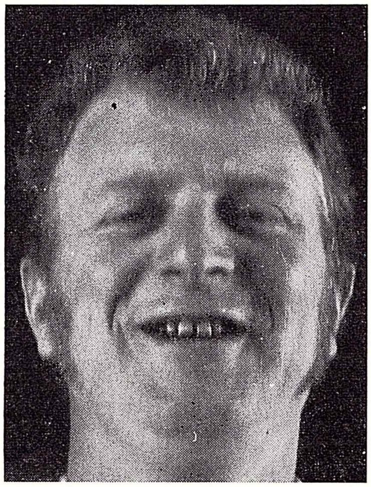
(Right centre): Seen — and photographed — at the Timaru meeting: Messrs Mark Johnson, Hornby; Tom Forrester (ex Morrison Coal Co. of Timaru); Stan Armstrong of Christchurch State Coal and Eric Lange of Thomas Brown Ltd of Christchurch. (Names read left to right.)

(Right lower): The warmth of the congenial atmosphere of coal adds to the efficient production of heat from coal. Engineering experts in coal use at Timaru (left to right) were Messrs Neil Trower (chief engineer) and Merv. Hawe (assistant chief engineer) of the Timaru Hospital and Lex Smith, most southern-based fuel technologist of the Coal Research Association.

DEPUTIES TWO



Mr G. ("Bushy") Freeman, a deputy at Strongman, and Mr Brian Hassan, a deputy at Reefton who plays a great game of 45s.



RECORDING ANGEL?

Those letters you write to Head Office of the Mines Department: Miss Barbara Mudge, who works in the head office records section keeps busy filing all those letters and cards that keep rolling in.

People in the coal industry

Two new faces in the coal industry: appointment to the Coal Research Association at Lower Hutt.

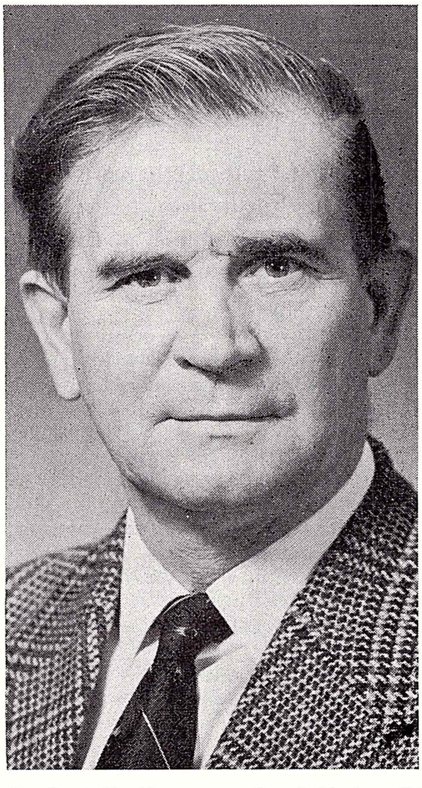
From the United Kingdom Mr Colin Hooker has joined the C.R.A. as an engineer to work on appliance development. Mr Hooker graduated B.Sc. in physics and mathematics from Exeter University, and has worked for G.E.C. on fluorescent lamps, then on the testing of packaging materials for the Dickinson Robinson Group. His last position in England was at Plessey working on integrated circuits. Married to a New Zealand girl, Mr Hooker has been looking for an opportunity to move to this country.

Miss Brenda Wilson, B.Sc., has joined C.R.A. as a research chemist. A farmer's daughter from Eiffelton in mid-Canterbury, Miss Wilson was educated at Ashburton College and Canterbury University. Her first project at the C.R.A. is to work on the reactivity of New Zealand coals.

OPENCAST FROM UNDERGROUND

Mr Frank Hennessey — "Pecker" — who manages Kimihia opencast mine at Huntly. Formerly an underground miner, Mr Hennessey has worked at the Buller and Ohura coalfields.

FROM THE DEEP SOUTH



Mr D. Bell, 11 years a Royal Marine, 27 years a coal miner at Ohai. Mr Bell is president of the Nightcaps District Miners' Union.

MECHANISED MINING ADVANCES

HUNTLY'S DISTRICT MANAGER LEARNS FROM AUSTRALIA

Mr J. E. Holm, District Manager of Mines, Huntly. Mr Holm was born in Cornwall, England, and came to New Zealand, to the Grey Valley, at 14 years of age. He began in the coal mining industry at Liverpool Mine in June, 1941, and then served in the second N.Z. Expeditionary Force. He returned to Liverpool, becoming a deputy in 1949. From 1956 until 1961 he was an underviewer at Paparoa, and went to Dauntless Mine at Reefton as underviewer when the mine opened in 1962. He became manager of Blackball Mine in 1964 and has also managed Stockton, Liverpool and Strongman mines. Last year he succeeded Mr J. Adamson as District Manager at Huntly, having been District Manager at Ohai previously.

A further step in developing coal mining in Huntly arises from the visit to Australia by Mr J. E. Holm, District Manager of Mines at Rotowaro.

Mr Holm returned in April from a visit lasting four months, when he saw laboratory testing of models of mine conditions, visited Australian mines, and liaised with Bechtel Pacific Corporation who are consultants to the Huntly developments.

During his first fortnight Mr Holm was at the Australian Coal Industry Research Laboratories at Chatswood, New South Wales. He saw a model of a mine structure, similar to conditions at Huntly, being tested. In the tests a model 10 metres long by two high and 0.4 metres thick is built to represent typical strata from the information obtained from boreholes. The differing strata are represented by cements of appropriate strengths, and the whole model is then compressed hydraulically to simulate the actual working pressures in the mine.

The object is to decide suitable working methods and means of strata control for the mine.

Mr Holm visited three coal mines in the Woollagong area, to learn more of the modern mining methods which will be used at Huntly. He spent some time at the Camden office of the Clutha Development Company to discuss planning for opening up new mines, and saw surface and underground installations at El.Com collieries at Newcastle. He observed a shaft-sinking operation at McQuarrie and visited two coal washeries in the Hunter Valley area.

All the installations and operations that Mr Holm saw are relevant to the development of coal mining at Huntly.

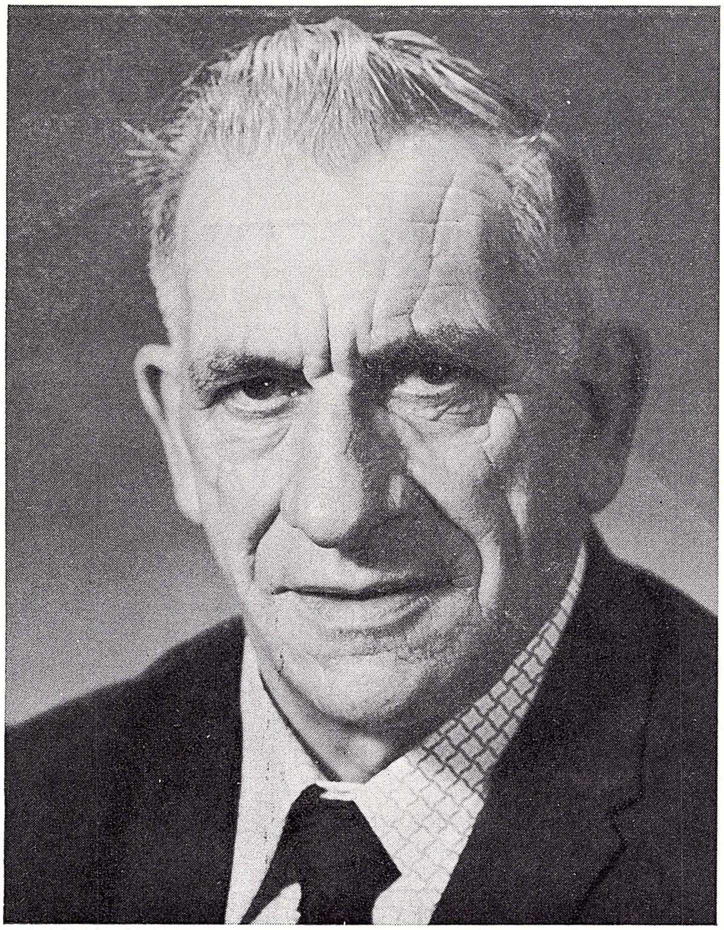
For the next three months he worked in Melbourne, at the office of the Bechtel Pacific Corporation. The corporation is the consultant and developer of installations and engineering at Huntly, and Mr Holm advised the planners on local conditions at Huntly.

"Australia's a most pleasant country to live in," Mr Holm says.

"Everyone was very helpful throughout."

At the end of his visit to Australia, Mr Holm went to see a test of a model of the Huntly coalfield. Only one other model test rig in the world — in Germany — compares with the Australian one for size. He also attended a three-day seminar about black coal before returning to New Zealand in April.

MR H. PATTINSON BECOMES MINERS' PRESIDENT



Mr H. Pattinson

Son of a coal miner, and grandson of two coal miners who lost their lives in the Brunner Mine disaster of 1896: Mr H. Pattinson of Runanga has become president of United Mineworkers.

He succeeds the late Mr A. V. Prendiville, C.B.E., who died in January.

Eighth in a family of 11 boys and two girls, Mr Pattinson was born at Runanga and was educated there. He joined his elder brothers — the younger were soon to follow him — in the coal mining industry when he began work in the Liverpool Mine at 14 years of age.

The year was 1933. "We'd work two days one week and three the next," Mr Pattinson says.

In those depression days he well remembers coal industry stalwarts of "Red Runanga" who later achieved Cabinet rank: Messrs A. McLagan and "Paddy" Webb. Mr "Bob" Semple is another who achieved Cabinet rank who Mr Pattinson recalls campaigning for the 1935 election.

Mr Pattinson's union activities began when he was elected to the executive of the local miners' union in 1949. Until his resignation following his election as president of United Mineworkers, Mr Pattinson had been president of the Runanga State Coal Miners' Union for nine years. He also served on the Grey Central Committee, which combines the activities of all the mining unions in the Grey Valley.

Better Working Conditions

As president of United Mineworkers, Mr Pattinson wants to work for better working conditions for the coal miners. He has taken a leading part in the union's interest in introducing hydro working into Strongman Mine, and wants to work for easier working conditions through the introduction of mechanisation in the coal mines.

"The more coal we can get out, the more we have of getting shorter work periods," he says. "We've all got to work on this."

Mr Pattinson looks forward to working in co-operation with the other organisations in the coal industry, in the common interests of promoting coal use.

He is married, with two sons — one a qualified carpenter-joiner, and the other still at school — and two daughters. One daughter is married, with two children.

Mr Pattinson was the second president of the Dunollie Bowling Green and is a foundation member of the Runanga Workingmen's Club.

International
Women's year
New Zealand
1975

1975 is being highlighted as International Women's Year: a good reason for introducing to "Coal" readers Dr Mary Fama who is computerising stress analysis for the new age of mechanical coal mining in New Zealand.

MINING MATHEMATICIAN

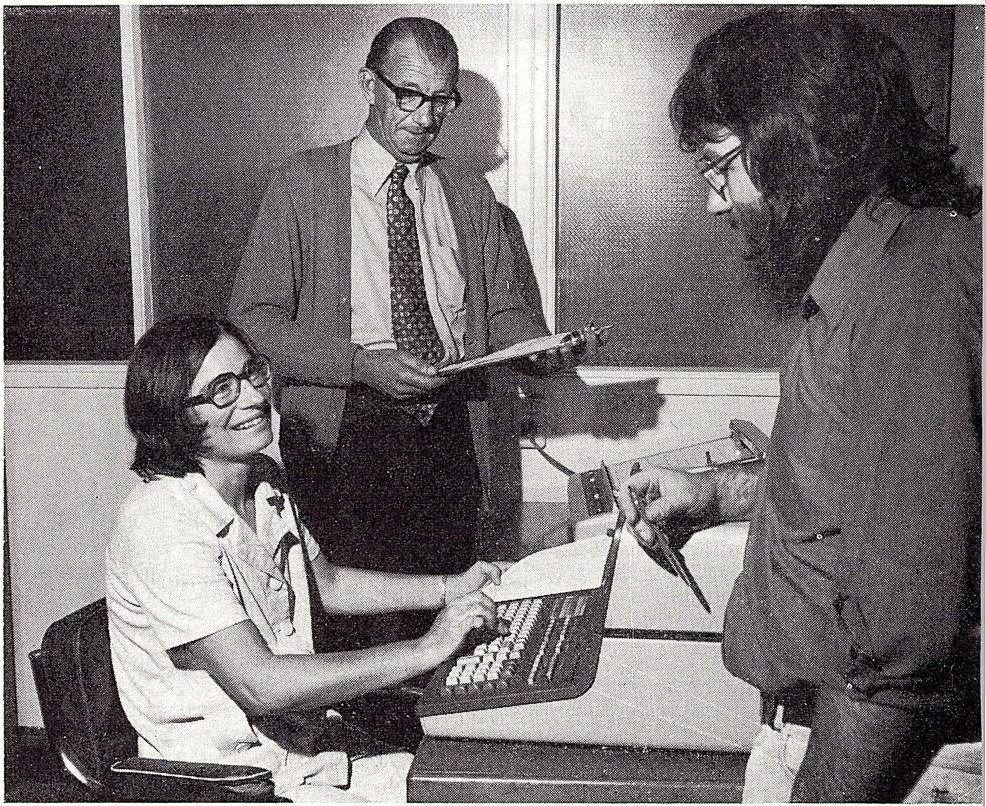
"My project is to develop computer programmes for stress analysis for underground mining," Dr Fama says.

"One of the problems I am particularly interested in is the best shape of the underground roadways for the new Huntly mines."

Experienced miners know to beware of danger when the coal "talks", signalling an imminent roof fall. But when a continuous miner is producing eight or 10 tonnes of coal in a minute, experience is not enough to hear danger signals over the din. The wider roads in mechanised mines need a new technique of roof support, and in Huntly, mining New Zealand's unique coals, answers from overseas practice do not necessarily apply.

Dr Fama says her work is to provide some clues regarding the best form of roof arch. At present the theoretical techniques are inadequate.

"I think a lot of experienced mining engineers would agree with me," she says. "They wouldn't base their designs on my work yet. They have a wealth of experience but analytical techniques are developing and we hope to get to the stage where these newer methods will give very good guidelines."



Dr Mary Fama, coal mining mathematician, pauses at her work on the Mines Department computer to discuss Huntly development problems with colleagues Ian McIntosh (right) mining engineer, and Bill Williams.

STABLE

An arched roof is more stable than a rectangular one — not surprisingly, the computer confirms this — but stresses in the ground must be determined before the exact shape of the strongest arch can be calculated.

"Pretty hairy" is how Dr Fama describes the present state-of-the-art of measuring stresses, and this is one of her problems in calculating arch shapes. "There are various constants like the modulus of elasticity which have to be measured and it's extraordinary when you get down to it how difficult these measurements are," she says.

"I've been doing a study to find out how sensitive even a crude linear analysis is to variations in these constants. Fortunately it's not too bad — you've got a certain amount of leeway."

The stress in an arch depends largely upon the geological history, particularly with jointed coal and rock strata. Analysis of stress of this kind is done by computer, using a "finite element" programme. Dr Fama describes this as a mathematical description of how you think the mass of layered material behaves.

"The analysis divides the materials up into little triangular sections in a plane across the roadway and then calculates the displacement at the corners and the stresses for each section."

She adds that this is a technique developed over the past 10 or 15 years and depends on using large computers.

SAFELY

By using these elaborate methods it is expected that new theories will be developed and new means developed to mine more coal more safely and more economically.

But: "It's pretty dicey at the moment," she says. For instance, water seepage is very important in changing material characteristics and modifying designs."

"Really delighted", was Dr Fama's description of a visit to Huntly to see coal mining at first hand. She visited the mechanised experimental mine at Rotowaro No. 5, which has wide rectangular roads, and the older mine at Rotowaro, developed by hand mining.

"The shape of the roof can give you clues as to actual stresses," she says of the older mine.

The shape of the arch in the new mines becomes important because the coal will be extracted at great depths for New Zealand. The horizontal stresses may be high relative to the vertical stresses and the arch has to be squashed down.

"That's known to experienced miners but we want to get it more accurate through analysis than we can through intuition," Dr Fama says.

HEAVE

Floor heave — where pressure on the roadway forces up the floor — may crop up as a very serious problem when the mine goes as deep as 250 metres.

"You have to take into consideration both non-linear properties of the material and time effects," she says. "A linear elastic analysis ignores both these and therefore cannot simulate floor heave. But we have not yet got a good computer programme to cope with these important complications."

Dr Fama joined the Mines Department about 18 months ago as a part-time employee. Born in England, she came to New Zealand after World War II with her family as a young girl. After gaining a B.A. degree at Canterbury University in Languages and pure mathematics, she took a B.A. degree at Oxford. Returning to New Zealand, she worked in ceramics research for the DSIR.

Three years at Harvard in the USA followed, when she gained a doctorate in applied mathematics, and came back to New Zealand to be married a year later in 1968. While her husband — a psychiatrist — worked in Sydney and Auckland Dr Fama lectured at the University of Sydney and later became the first woman member of the Faculty of Engineering at the University of Auckland.

The two Drs Fama and their three children are settled in Kingston, Wellington.

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USSR coal industry

Prospects & Trends

By Vladimir Ivanov, Chief of the Technological Opencast Mining Board of the USSR Ministry of Coal Industry

Economically coal extracted by the opencast method is on a par with liquid fuel. When we speak of the problems and prospects of the development of power engineering, this is a weighty, but not the only argument in favour of coal.

As stated by statisticians, the globe has five times more coal than oil and gas taken together. In addition, in the future oil and gas will be used mainly as technological fuel.

Thus coal will remain a major kind of mineral fuel resource in the future, too. This is especially true of coal, extracted by the opencast method, which is the most economical one.

WORLD'S LEADER

Since 1958 the Soviet Union has been leading the world in coal extraction. The rise in coal output is stable: 624 million tons in 1970, 668 million tons in 1973 and 700 million tons in 1975 (the plan's target). The positions of coal in the Soviet economy are quite reliable in future too: the USSR possesses over 50 per cent of the world's prospected coal reserves.

The increase in coal extraction by the opencast method is the main trend in the development of the branch. Today there are 70 opencast mines in the USSR which produce over 30 per cent of the Soviet Union's coal output. In 15 to 20 years the coal extraction by the opencast method will account for more than half of the coal output.

The efficiency of the method may be judged from the experience of Eastern Siberia where each ton of coal mined by the opencast method is nearly five times cheaper and labour/productivity is more than six times higher than at conventional mines.

Some 80 per cent of the USSR's coal reserves is concentrated in the country's eastern areas. Coal extraction was intensified with the shifting of the industry eastward and the upsurge of the productive forces of Siberia, Kazakhstan and Central Asia. In 1975 it is planned to opencast mine the following amount of coal: 48 million tons at Ekibastuz in Kazakhstan, 37 million tons in the Kuznetsk coalfield in Western Siberia and 27 million tons in the Kansk-Achinsk coalfield in Eastern Siberia.

COAL ON CONVEYOR

Mechanisation and automation are typical today for any sections of the Soviet coal industry. The opencast method makes the mechanisation cheaper and extends the opportunities of using technical facilities.

Today use is made here of excavators with the shovel's capacity of 8 to 25 cubic metres and with a jib length which makes it possible to carry the rock which covers coal to a distance of 70 to 100 metres. At the Nazarovo opencut in the Kansk-Achinsk coalfield the country's largest walking excavator with the shovel's capacity of 80 cubic metres is being mounted. Rotary bucket excavators with a capacity of 1000 to 3000 tons per hour are especially promising.

Now the USSR devotes much attention to improving the whole technological process of coal mining and fuel using. For instance, on the new continuous technological line in Siberia the extracted coal will be transported by a conveyor method to the electric power station situated not far away. Specialists' calculations indicate the high effectiveness of comprehensive mechanisation and automation.

Enlarging enterprises is another way of raising economic indices. If in 1970 the average annual coal output per opencut mine in the USSR amounted to 2,338,000 tons, in 1973 it reached 2,707,000 tons and in 1975 it will top 2,980,000 tons. The Bogatyr opencut mine in the Ekibastuz coalfield is the largest in the world. Its design capacity is 50 million tons of coal a year.

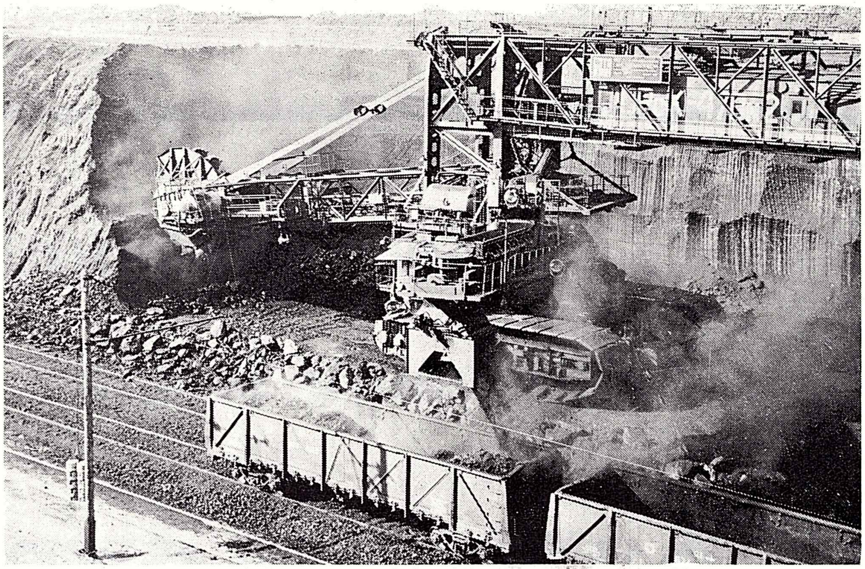
PROSPECTS

The prospects of the coal industry development are to a great extent linked with the solution of the problem of efficient fuel transport over large distances. This problem has assumed special acuteness in connection with extracting brown coal of the unique Kansk-Achinsk coalfield.

Soviet scientists are researching along two lines. The first way envisages constructing high-voltage lines to transmit electric power generated during coal's burning. It is planned to lay an experimental ac line with a voltage of 1150 kilovolts. A complex of high-voltage and transducing equipment is being set up for dc transmission lines with a voltage of 1500 kilovolts.

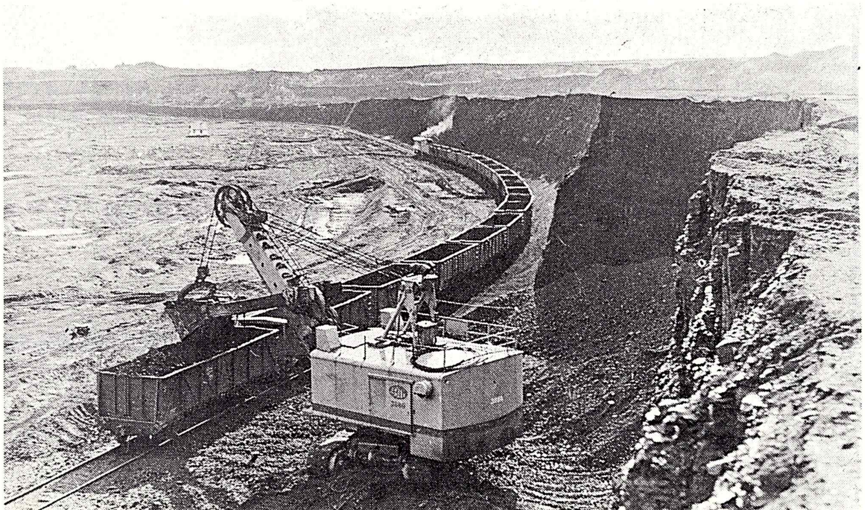
As well as direct burning, it is planned to process Kansk-Achinsk coal into resinised semi-coke and resin. It will be advantageous to transport semi-coke — fuel with a high calorific value — over great distances. Resin will be processed into benzol, naphthalene and other chemical products but with lower cost price than at conventional coke-chemical installations.

In a word, researchers have established a rather wide sphere of coal utilisation. Opencast mining will remain a major index of the development of the Soviet economy.



In one of the opencuts of the Ekibastuz coal deposit, USSR.

Coal loading in the Kansk-Achinsk coal region, USSR.



ONCE UPON A TIME

John Seymour, a fuel engineer of the Coal Advisory Service at Christchurch, contributes some thoughts on rationalising energy resources.

Once upon a time, Coal was King, and was the undisputed master of the power game, servicing most industrial enterprises. The dairy industry was weaned and grew to lusty proportions on it, and the same fuel nurtured its big brother, the meat industry. In fact it wasn't until this right little, tight little country started to enjoy the fruits of its labours that coal was deposed and dismissed as "out of date", and not really "with it" amongst chromium plate and stainless steel image of the new environment.

Probably it would be more true to say that the bright new ideas of technological advancement were all channelled into the other sources of power, and coal was left so far behind in the race that it made the perfect analogy of the Tortoise and the Hare.

Many projects relating to coal were shelved when priorities dictated that the money earmarked for these should be spent in other fields. Now of course the emphasis is on coal, and what can be done to improve its quality, its burning characteristics, preparation and handling. In fact, with so many people in different countries involved in this type of work it must follow that developments of far reaching significance will be made.

INSATIABLE

Most of us are very well aware that in a world of increasing demand for power that seems insatiable, our reckless waste of dwindling resources must be brought under control. It's almost impossible to guess what the situation and conditions of living would be like if one of the major sources of power were denied us: coal, gas, and oil. None of these is self-generating and each has a terminal life.

The only definite fact we do know is that each in its turn will cease to exist, and if the experts are to be believed, oil will be the first, in about 25 years' time. Twenty-five years sounds quite a time doesn't it, and a lot of us won't be bothered because — well, we won't be here will we? But how about that class of five year olds in kindy right now — they'll be up to their long hair cuts in it.

Coal has the longest expectancy of life by far, so it would seem that a resurgence of coal is inevitable — simply because there is more of it. Electricity is the premium man-made fuel of the age and can be generated from different sources, the best from a conservancy point of view being hydro or natural thermal. The output from these sources may be subject to river or lake storage conditions and they may vary quite a bit, but they are self-generating, and with care they will always be available. Oil, gas and coal have also been used for many years to generate electricity, but — and it's a very big "but" — there's a snag.

ONE THIRD

Only one third of the energy that was originally in the oil, gas or coal is able to be transformed into electrical energy. In fact we lose two thirds of it which is a pretty high price to pay for say heating a room at the flick of a switch. Rationalising the use of energy means that we put the fuel to its most efficient use, and in that context, electricity should be used only where others cannot do the job such as driving motors or lighting, etc.

It would be simple indeed if we could meet all extra electricity demands by building more and more hydro stations, but there comes a time when rivers, irrigation and the liberties we take with natural resources simply refuse to support it, and the wise man knows when to compromise to get the best of a balanced interference with nature.

Take a good look at the things around you — at home, in the office, or in any surroundings that are man made. Ninety-nine percent of all you can see, touch, hear and smell has been produced, transported, preserved, or whatever you will, by some sort of heat treatment. Without heat we simply cannot have any of the things that we accept as being the right of everyone accustomed to a reasonable standard of living.

We are fortunate to have on our own North Island doorstep, a great reservoir of gas, and optimistic speculation insists that it is only a matter of time before oil or more gas is found. This may well be so — indeed it is to be hoped so, but this should not preclude implementing rationalisation as soon as possible, if we are to learn anything from the lesson we have just been given with regard to oil.

The days when oil was produced as fast as the consumer could use it are gone — we have seen the end of an era in that regard, and the declared policies of oil producers are to make it last as long as possible, postponing that time when the inevitable must happen.

All of us today are aware of what the law supply and demand is, and when the demand comes from everybody, and a diminishing supply is controlled by a few, it doesn't take much thinking about to arrive at a conclusion that cannot be far wrong.

PRIORITIES

It is interesting to speculate how long it will be to the time when priorities for fuel distribution will bring with it the thought that "My car is a necessity and yours a luxury".

We have already seen how wasteful a thermal generating plant can be if its sole function is to generate electricity, but in many parts of the world that is only the beginning of the story. Steam that has driven turbines to produce electricity can be reheated and used again — it can also provide heating for industrial uses in the factory, and when it has done its work there, the last of the heat can be extracted from it by utilising it as a water heating medium or for centrally heating buildings.

It would seem then that a pretty good start to this fuel saving business could be thought about right away.

UNITISING

For a long time now, people have welcomed the idea of unitising a city into its various component parts.

1. Industrial and manufacturing areas.
2. Shopping and commercial areas.
3. Residential areas.

This is one form of rationalising our efforts to make a living and also to enjoy our leisure — people prefer to live in a quiet area away from the noise and hubbub associated with industry — on the other hand, which one of us goes to the corner shop for his or her Friday night shopping? No — we gravitate to where there is a collection of shops and stores, because it's more convenient and efficient to have shops grouped together.

Let us take just one instance — industry — the largest one as far as fuel consumption is concerned, and throw a few ideas in the pot on how to conserve fuel. Supposing we have an industrial estate that supports a cross-section of typical manufacturing processes.

1. They all need electricity.
2. They all need heat of some sort, either for processing a product or for central heating or both, and for the majority this is usually supplied by steam.

ADVANTAGES

Supposing now that we could supply these needs from a central plant — one that is designed just for that, the end product is electricity and steam. Well, what are the advantages?

1. One large sophisticated plant would most assuredly cost less than nine or ten separate units.
2. Because it would necessarily be large, it would need a very tall chimney which would please the Health Department, and because of its size, machinery for the control of grits in the effluent discharge would be sophisticated, in fact a big step forward in minimising air pollution. From small beginnings like this, given the right climatic conditions, whole districts of office blocks and houses can be incorporated in the heating scheme. This sort of thing happened overseas — it can and most probably will be repeated in New Zealand.
3. Running costs would certainly be considerably lower.
4. Because steam is the end product to be sold, attention is solely concerned with efficiency of combustion and quality of steam. This doesn't apply where the engineer is mostly concerned with producing tins of boiled sweets or whatever the product might be.
5. All the fuel — (and I naturally presume this to be coal) can be isolated in one place which is easier from a delivery point of view and quick turn around of wagons — this also eliminates dirt and dust around factories not equipped with good handling plant.
6. Steam to each factory could be measured by metering and paid for accordingly — exactly the same way as water and electricity is sold. These services could be extended to others that are commonly used in industry — for example — compressed air.
7. A plant of this size could not be just operated on a daytime basis, and although the majority of the load would be felt in the daylight hours, the generating of electricity would still continue and this could be fed into the National Grid System.

At present the two fuels of long-term significance in New Zealand are gas and coal in the North Island and coal in the South — these are the only fuel with reliability of certainty of stability, so it is not surprising that a resuscitation is predicted for the coal industry — but then — it's only a fairy story isn't it?

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$2 MILLION DOLLAR DRILLING PROGRAMME

"Cabinet has approved spending nearly $2 million to search for more coal in the South Auckland and Waikato districts," the Hon. Fraser Colman, Minister of Mines, has announced.

"Because of the changes in the energy situation, the New Zealand Electricity Department has asked my officers if they can make available an additional 100 million tons to provide the energy for two new power stations in the South Auckland area.

"But the search will not end there, by the time the drilling work now approved is nearing completion, officers of my department will have submitted a more comprehensive exploration programme to investigate coal resources over a much wider area of New Zealand."

The Minister explained that the current financial approval covered the drilling and analysis work for more than 200 holes. This work would be undertaken over the next two and a-half years, to bring the desired quantity of coal into the category of measured reserves.

The foreseeable demand for electricity made it imperative for the Electricity Department to know, by early 1977, that sufficient coal was available in the South Auckland region to enable planning and design for the 1000 MW power stations.

"The approved expenditure for the current programme will only provide sufficient information to prove adequate reserves of coal. An equal amount of drilling work will be required to determine accurately the contours of the coal seams, and for planning of mine layouts," the Minister says.

GOVERNMENT AWARD TO STIMULATE ENERGY CONSERVATION

As a conservation measure the Government has established an award to encourage industry to conserve energy and materials and to prevent waste in all forms.

The awards will be made annually to a company or firm in each of the four main cities, plus one provincial centre in the North Island and one in the South Island, for the most significant contribution to the saving, or the more economic use of physical resources — particularly raw materials which are aids to production and energy.

A certificate will be presented, not only to the award winners but to each member of the winner's committees organising the savings also.

Each award-winning company or firm may nominate a member of its staff and his or her spouse for a week's free holiday, with spending money, within New Zealand or a neighbouring Pacific Island.

Winning submissions will be assessed by the Secretary and the Resource Conservation Officer of the Department of Trade and Industry.

Apply to:

The Resource Conservation Officer,
Department of Trade and Industry,
Private Bag,
Wellington.

Each application should be presented in the form of a concise report covering the applicant's efforts in conservation.

In general it should emphasis:

1. The total effort — electricity, other fuels, materials, water, productivity gains, etc.
2. The efforts of an applicant's staff (individuals can be named); how awareness of resource conservation has affected all levels of staff and what this has contributed to eliminating waste.
   Specific details are requested covering:

1. **Energy Consumption**
   (a) Demonstrate and quantify savings in all forms of energy use.
   (b) Explain how the savings have been made:
      (i) By using less energy.
      (ii) By using energy more efficiently.
      (iii) By using other fuels.
      (iv) By a combination of these.
   (c) Explain significant process modifications which have saved energy.
   (d) To what extent have conscious staff efforts contributed to energy savings?
2. **Raw Materials**
   (a) Demonstrate and quantify savings in materials usage.
   (b) To what extent does this save energy?
   (c) Explain the extent by which process changes, design and value analysis have contributed to savings.
   (d) Detail the extent of re-use, recycling and remanufacturing of wastes undertaken.
3. **Pollution and Disposal Costs**
   Explain the effects of the achievements on pollution and disposal, particularly water use.
4. **General**
   Explain the significance of any seasonal, production and employment fluctuations on the conservation effort described.

DEVELOPMENT OF LIGNITE FIELD

Southland's natural resources, particularly the vast Mataura Valley lignite fields, are again coming under the spotlight. A resources committee, consisting of members of the Southland Regional Development Council and the Southland Progress League, is considering further development of the province's resources.

This follows publication of the "meat" the committee hopes to get its "teeth" into — papers presented at the Southland regional resources development conference in July last year.

The Government has approved a survey of the total lignite resources in the Mataura Valley, and financial allocations have been made for the survey to start this financial year.

A report by Messrs J. M. Hope, D. S. Nicholson and T. Marshall, of the chemistry division of the Department of Scientific and Industrial Research, states: "Investigations in Otago and Southland have indicated the presence of very large deposits of quartz gravels suitable, with washing, screening and possibly colour sorting, for the production of ferro-silicon and silicon metal.

"Extensive lignite and sub-bituminous coal deposits in Otago and Southland appear to be suitable sources of redundants for smelting operations, supplemented if necessary by wood chips and wood charcoal from local timber resources, coal and coke from the West Coast and imported petroleum coke," the report said.

POWER NEEDS

"Undeveloped hydro-electric power resources in Otago are at least potentially capable of supplying industrial electric power for silicon or ferro-silicon smelting; low-cost lignite in the district is also a potential source of power for electric power generation.

"Production of silicon and/or ferro-silicon on an economic scale would far exceed the small New Zealand market for such products, hence any commercial production would have to be mainly for export to overseas markets," the report said.

"The most promising site for export production would be the Invercargill area where quartz deposits, lignite, timber resources, road, rail facilities, housing and fresh water supplies are all located within reasonable distance of Bluff harbour." — "Mataura Ensign"

MINING POETS TO RETURN?

Three mining poets invited to read their works in the heart of the British coalfields may be asked back again this year.

The three — Mogg Williams from Mid-Glamorgans' Ogmore Vale, Jeff Fletcher and Herbert Dexter from the South Midlands — were invited to do three readings by the county council's leisure services department.

Said the department's deputy director John Deere: "They definitely made an impression and we're looking into the possibility of asking them back to read their work at one of the Nottingham universities' communications courses for mine-workers this year."

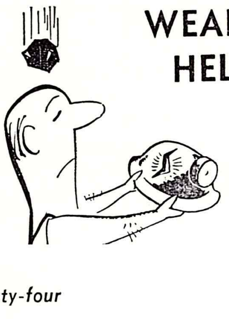
The readings were at Cotgrave, Mansfield and Nottingham. Both Mogg Williams and Herbert Dexter served a total of about 50 years in the pits. — British "Coal News".

Coal Verse

"I wrote this poem called 'Coal'," writes 10½-year-old Sarah Bryan of Christchurch. "My dad told me to send it to you."

COAL

Coal is a rock
  Dug out of the ground,
Coal is a thing
  That's handy around.
This thing called coal
  You put on the fire,
It makes the flames
  Leap higher and higher.
Coal is the thing
  That shuts out the breeze,
Without any coal,
  I'm sure we'd all freeze.



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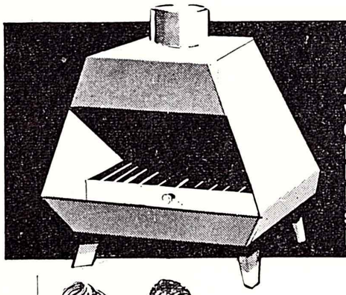

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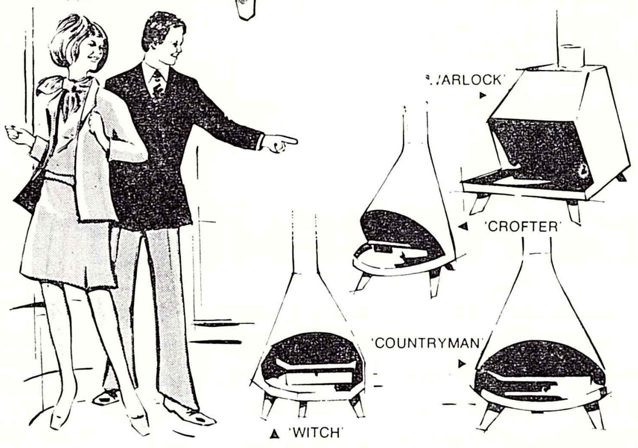

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book reviews

"LOCOMOTIVE SELECTIONS FROM THE N.Z. RAILWAY OBSERVER"

New Zealand railway enthusiasts now have the opportunity of adding another volume to their bookshelves, following publication of "Locomotive Selections from the NZ Railway Observer", edited by P. F. Dyler.

The volume recalls some favourite engines which have made history in New Zealand railways. Previously printed articles from the "Observer" give enthusiasts the chance to have them in book form for ready reference. Attractively bound, the volume is printed on good quality paper, bound in hard covers, and includes enough illustrations to conjure up a vision of the hiss of steam and the action of conrods and valve motions.

Appropriately the first article features the original class "A" engines, at least one of which forsook NZR service to enter the coal-mining industry. The next class featured, the historic "F", is another classic locomotive of NZR history which has a long and honourable association with coal mining. The Mines Department "Fs", at Kaitangata and Rotowaro left coal to continue an active retirement in the hands of preservation enthusiasts only three or four years ago, and these near centurians could hardly be left out of any local locomotive book. "Fs" also operated on the private line at Ohai, as well as serving on Government lines on the West Coast.

The Ohoka Punt — a Canterbury branch line — and the Peckett locomotives at Portland are covered (do "Coal" readers remember the Peckett at Rotowaro?). The only Mallet articulated locomotive in New Zealand is mentioned. As a private import for a timber company, this is a locomotive not usually covered in many books about New Zealand railways. Also briefly appearing is the "Price" locomotive.

The fourth section of the book fittingly climaxes with the Class "K" engines of imperishable memory to anyone who has ever seen steam in all its awesome majesty in the days when it ruled supreme.

The "Ks" were a highly successful class that railway engineers in New Zealand, and NZ Railways in particular, have every reason to be proud of. When British railways, so often held as a paragon of locomotive design, are now shown to have so many imperfections before the post World War II amalgamations, it is right that New Zealand design achievements should be kept before us.

Fittingly, this book closes with an article " 'Kbs' on the Midland Line" — and the title will recall for the coal industry those long trains of coal waggons which appeared "through the tunnel" to be hauled to a Christchurch depending on coal for its power and warmth — headed by the might of a coal-fired, boosted "Kb".

The history of each engine in the classes given is given in the book, with diagrams and measurements that will be handy for modellers.

Now that New Zealand railways are engineered for the lesser hammer-blow of the diesel, and the gauge at curves has been tightened, the only place for railway steam is the Kingston Flyer and the dedicated efforts of the enthusiasts to preserve the survivors of our transport history. Overseas railways can point to more achievement in preserving steam locomotives for posterity than has been the case in New Zealand. The work of the New Zealand Railway and Locomotive Society Incorporated in giving us another volume, at $4.80, to keep alive the memory of our transport engineering achievements is worth buying for what is between the book's covers, apart from deserving support. — Ed.

"THE OLD NZR 'C' CLASS TANK LOCOMOTIVES"

A handy reprint from the "NZ Railway Observer" in pamphlet form is an article by T. A. McGavin on one of the classes of engine that pioneered Vogel's railways as they opened up New Zealand to European settlement and development. Now over a century old, one survivor is at present being restored by Wellington enthusiasts after being retired from active work for the Mines Department at Rotowaro only three years ago.

The "C" class was deceptive. Small, it was nevertheless a capable workhorse within its limits and gave sterling service on the light Vogel lines before increasing traffic required better lines and heavier stock. Illustrated, and with useful diagrams and measurements, this reprint at 50 cents by the New Zealand Railway and Locomotive Society should be on the shelves of every railway enthusiast who wants to build up his reference about New Zealand railway history. — Ed.

"NEW ZEALAND'S FIRST RAILWAY"

In case we had forgotten, the NZ Railway and Locomotive Society has republished the late A. N. Palmer's pamphlet on the Dun Mountain Railway, Nelson.

This line was laid down to extract minerals and convey them to the port of Nelson in the last century. Because it used horses, and not steam power, its claim as New Zealand's first railway is usually overshadowed by Canterbury's line between Christchurch and Ferrymead, and with this pamphlet for reference any Nelsonian or dedicated railway enthusiast will have a sure reference when disputing Canterbury's priority. It is unfortunate that Nelson, as the first city to have a railway, should be the only one today without a railway, and the reissue of this pamphlet may restore the balance of Nelsonian association with rails.

For only $1.20 the purchaser has a 27-page booklet, well illustrated, on good quality paper and with a two-colour cover. There is very little change from the second edition for those who missed buying the original when it was first published in 1962. — Ed.

COAL MINING ERA IN NORTH OTAGO ENDS AS SHAG POINT MINE CLOSES

Over a century of coal mining at Shag Point ended when the historic mine closed in May. Shag Point, on the coast 31 miles south-west of Oamaru, is famous as the only mine in New Zealand which once mined coal from under the sea.

The quantity of coal mined at Shag Point was never great, and the coal was a lignite of low calorific value which did not contribute to the economy of the mining operation. Shag Point was mining about 2,000 tonnes annually and this was mixed with 4,000 tonnes of Ohai coal and used for generating electricity at the Pukeuri freezing works. From now on the works will use Ohai coal exclusively.

The mine was bought by Waitaki Industries from the McLareen family and the coal was used to produce electricity for the national grid. This was in the 1950s when there was an electricity shortage before Roxburgh dam and its generators were producing power. When Roxburgh came on stream the power shortage became less acute and the company switched over from the national grid to using its power itself.

Then in recent years the Mines Department discontinued the company's operations in the shaft that extended below the sea floor because the overburden was measured at less than 40 feet, the legal minimum. Work began on the inland end of the shaft but the seam ran out and new excavations were begun.

Mr A. W. Larkins, chief engineer at the Finegand freezing works, was previously employed at Waitaki and in his capacity as chief engineer there he was involved with the coal mine for some years.

Mr Larkins said that much of the coal in the area was faulted and the new excavation had what he described as a "split" in it. The split is a layer of soft rock in the seam and is difficult to distinguish from the coal. In the case of Shag Point the split was up to several feet thick in places.

The split in the seam meant that the value of the coal dropped even more as the soft rock was practically impossible to separate from the coal and a very high ash content (as much as 27 per cent) was the result. This difficulty coupled with the high cost of present day underground mining meant that closure was almost certain.

Difficulty in locating skilled labour added to the problems that Waitaki Industries faced in maintaining the mine. The competitive higher quality coal available at Ohai and Kaitangata opencast mines meant that the close down was an economic inevitability.

At the time of closedown the mine was supporting a staff of four.

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AUSTRALIAN FIRM LOOKS AT INDONESIAN COAL

As part of a comprehensive plan to invest in Asian natural resources, Conzinc Riotinto of Australia has taken up equity in an extensive deposit of steam coal located in Sumatra, Indonesia.

Sumatran mining department officials claim the reserves of steam coal in the field are immense and will allow export production of at least 25,000,000 tons per year over the 30-year life of the work contract.

They say most of the coal from the field in central Sumatra will go to Japan, which has indicated it plans more electrical generation by coal and nuclear power because of the high cost of oil. — "World Coal".

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MULTI-NATION COAL MINE VENTURE FOR INDONESIA

An extensive steam coal deposit in Sumatra will reportedly be mined by a British, United States and Australian group. The group has obtained a 30-year lease over the deposit, which preliminary reports indicate may produce at least 25,000,000 long tons of coal per year for the period.

Most of the coal will probably be exported to Japan for use in electric power generation facilities. This project is expected to be highly important for Indonesia's plans to revive and greatly expand its coal industry. — "World Coal".

BRITISH COAL MINING ACCIDENT RATE

Machinery and surface accidents accounted for nearly half of the 56 pit deaths in 1974-75, says the British "Coal News".

For the first time machinery became the biggest cause category, with 11 fatal accidents — 27 per cent of all deaths — compared with three the previous year.

"This is grim," says the chief safety engineer of the British National Coal Board, Mr John Collinson. "More machinery is being used in pits, but it has certainly not quadrupled in a year like the accident figures."

On accidents where mineral loading machines have slewed. Mr Collinson stressed: "Operators should always work from places of safety and not expose themselves to hazards — and other pitmen nearby need to make sure they are always working in safe positions."

Surface accident deaths showed a "savage increase" — going up from four to 12 during the year. Main causes were cranes, shovels and other vehicles running over people, and workers falling from heights. There is concern that three of the eight accident deaths so far this year have also been on the surface.

The pedestrian-type accidents could be avoided by sensible kerb drill — and surface improvements currently being carried out under new specifications could help to reduce these accidents.

Mr Collinson says the potential dangers in working at height are well known, but "we are still finding cases where improvised platforms have been used, and safety harnesses worn but not clipped on."

Nine officials died in accidents in 1974-75 although none was killed in individual accidents the previous year. "In some cases they were killed on jobs they should have been supervising for safety, and there is no substitute for being alert to the hazards of a situation," adds Mr Collinson.

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JAPANESE COAL IMPORTS, 1974

Japan imported a total of 45,380,906 metric tons of bituminous and anthracite coal from January through September 1974, according to the U.S. Bureau of Mines. This represents an increase of 8.6 per cent of 3,592,044 tons over the same period in 1973. Of the total, 44,355,534 tons were bituminous and 1,025.372 tons were anthracite.

Origin and amounts of coal in metric tons imported were:

Country	Amount	Per cent
United States	17,270,651	38.1
Australia	16,417,191	36.2
Canada	7,160.791	15.8
USSR	2,564,040	5.6
Poland	920,247	2.0
Others	1,047,986	2.3
Total	45,380,906	100.0

— "World Coal".

DISTRICT NEWS

- OHAI -

(Correspondent: W. Elliott)

Saturday, April 22 saw the Ohai Railway Board celebrating 50 years of operating.

To celebrate 50 years and 12 million tonnes of cargo, an F class steam locomotive hauled a special train from Wairio to Ohai. This was followed by an official function at Taylor's Hotel, Ohai.

At present the railway is handling more than 200,000 tonnes a year with only 12 employees. It is a major transport organisation, debt-free and with assets of a replacement value of more than $1 million, acquired solely from income.

Although the Ohai Railway Board has power to do so, it has never raised rates or levies on property in the district. It is also the only local railway in New Zealand. It is controlled by a board of three, one representative of the New Zealand State Coal Mines and two representatives of inhabitants of the district who financed the line.

Freight on coal was 2/- a ton on all grades in 1950. Today it is 36c.

FAITH

The story of the Ohai railway is a story of faith, endeavour and achievement. And the man to whom much of the credit must be given for its establishment and successful operation in its early years was the late A. W. Rodger. This was acknowledged by the board itself on the occasion of the official opening of the railway on March 30, 1925, when a resolution was passed recording his outstanding services in the promotion and construction of the line and in the successful management of its affairs.

"Members of the board now unanimously desire, on behalf of the people of the district, to place on record its grateful recognition of this great public service and its sincere admiration for the tact, energy and ability with which, in the face of difficulties and opposition, Mr Rodger has brought this undertaking to a successful issue," the minute said.

"The railway is now in active operation and the board is in a sound financial position. The development of the district and its vast mineral resources has been made possible, and the people, not only of Southland, but of a great part of the South Island, are reaping the benefit."

WEALTH

With all its wealth of mineral resources, the Ohai district could profit little as long as it suffered from a lack of convenient and speedy communication with the markets. Before the Ohai railway only two mines were operating in the Ohai field under much difficulty because of the crude and inadequate means of transport to the outside market.

The coal had to be carted to Nightcaps railway station, two miles away, and the roadway speedily became and remained a lane or line of quagmire of indescribable squalor.

Starting on moderate lines, a tramway was first laid down and began operating in 1914. Two years or so before a number of coal leases had been granted. These new mines were about five miles from Nightcaps, the nearest station. It meant that the output would have to be taken over five miles of inexpressibly bad roads.

Then it was that the mine owners and the settlers determined to combine to help themselves. They were willing to invest their own money in the scheme and pldge their own credit, but the immediate difficulties presenting themselves and later those of the Kaiser war defeated the scheme for a time.

DETERMINED

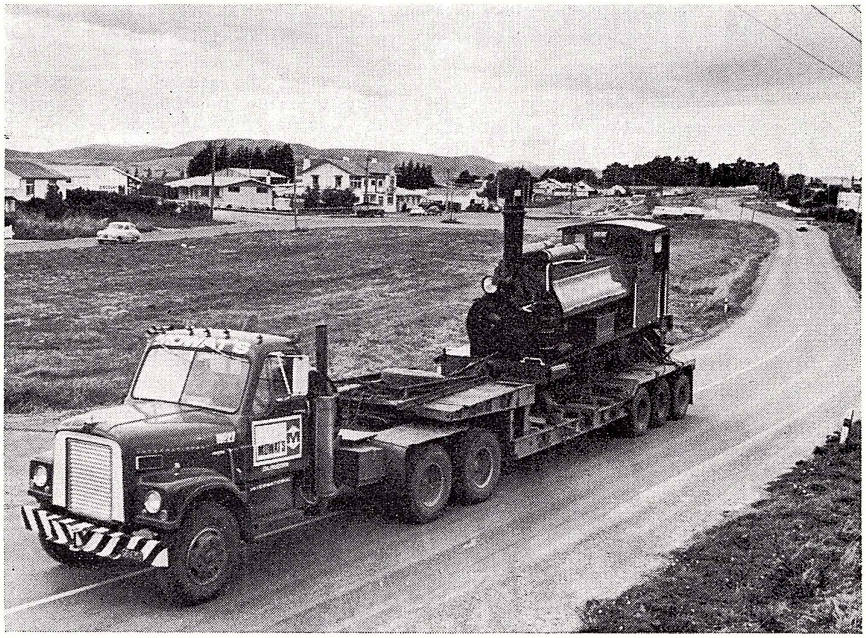
But the promoters were determined to push ahead, and in the teeth of opposition and after several official inquiries they were enabled to secure the constitution of the Ohai Railway District. That was in 1916.

This railway was the first to be constructed under the Local Railways Act, 1914. The railway was set up in the face of opposition from the Wairio Railway and Coal Company, the Nightcaps Coal Company and a few residents of Nightcaps as well, and in 1916 a Government commission heard the evidence of all parties. The objections were, in the main set aside, the company agreeing to take over the tramway owned by the Wairio Railway and Coal Company. The Ohai Railway District was thereafter constituted in May, 1916.

PERMANENT

In 1918 the board was approached by three coal companies who urged the construction of the first section of the permanent line. Again the Nightcaps

A 96 year old "F" steam locomotive travels to Wairio to take part in the celebrations for the Ohai Railway Board's 50th anniversary. The engine was lent by its owners, the Otago Branch of the Railway and Locomotive Society, who maintain it in running order for their line at Dunedin. The engine is one of a very famous class in New Zealand locomotive history, and one of the class was used on the Ohai line for some years.



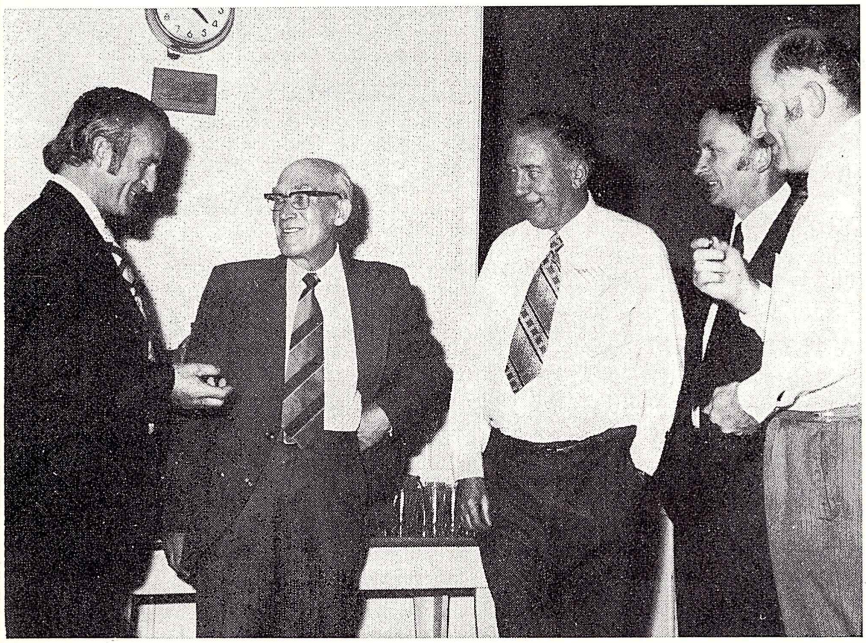
Coal Company objected, but was overruled, and by 1925 the new permanent way was completed, covering today a distance of approximately eight miles three chains, from Wairio to Ohai.

The railway now serves two underground mines and three opencast mines, all now State-controlled. Starting with practically nothing, its assets today are valued at well over $500,000 and include locomotives, building and permanent way. The board operates the New Zealand Railway rolling stock on its own locomotive power.

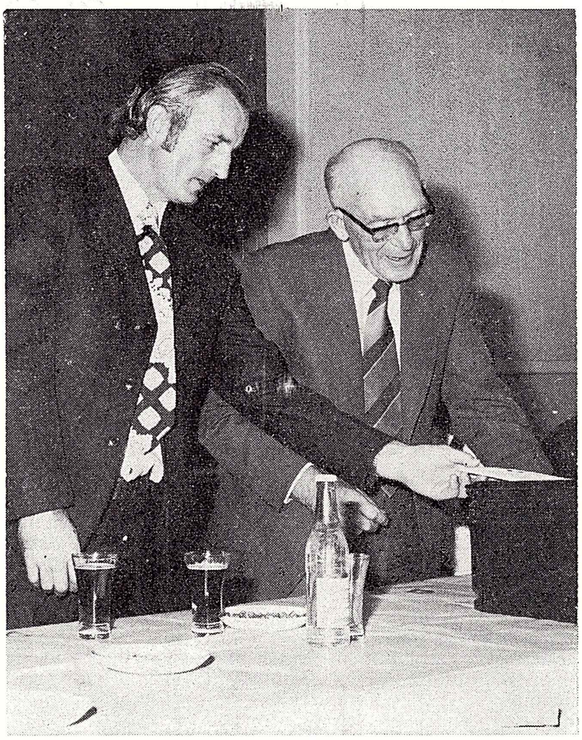
Because of the development of the Ohai field through the establishment of the railway, Nightcaps today is a prosperous residential and business community. Coal was its beginning, and coal is still its lifeblood, even though the area of operations is steadily widening.

Ohai, too, the town five miles west and nearer to the main fields, is also a prosperous community, with all the necessary facilities for a progressive town life.

— HUNTLY —



Colleagues farewelled Mr T. Glendinning on March 5, when he retired as Assistant District Manager of Mines, Huntly. Left to right: Mr R. Duggan, who has replaced Mr Glendinning, and Messrs D. Brown (production engineer, Head Office); A. G. Summers, Director of Adminsitration and W. Partel (Assistant Secretary of Mines, Designate).



Mr. R. Duggan (left) takes over from Mr Glendinning as Assistant District Manager of Mines, Huntly and hands his former colleague a gift from friends in the coal industry.

COAL INDUSTRY REVIEW

Miller Freeman Publications Limited, the U.K. subsidiary of the San Francisco-based publishing company, announce the publication of "Review of the World Coal Industry to 1990" by W. L. G. Muir.

The oil crisis brought with it a sudden and dramatic interest in information on alternative energy sources in general and in world availability of coal resources in particular. Reliable data in this field is difficult to find and very few up-to-date sources of information are available for ready reference.

This volume was compiled by the author in conjunction with Resources Engineering and Management International Limited, a firm of professional resources engineers, economists and management consultants. It deals with the effect of the energy crisis on the world coal industry and the capability of the industry to expand its production, to reduce its dependence on oil and natural gas for power generation and eventually to provide oil and gas by conversion.

Part I of the Review is a general survey covering in detail all countries with significant coal reserves and in addition brief details are also given for those countries with minor production or potential production. The information given includes:

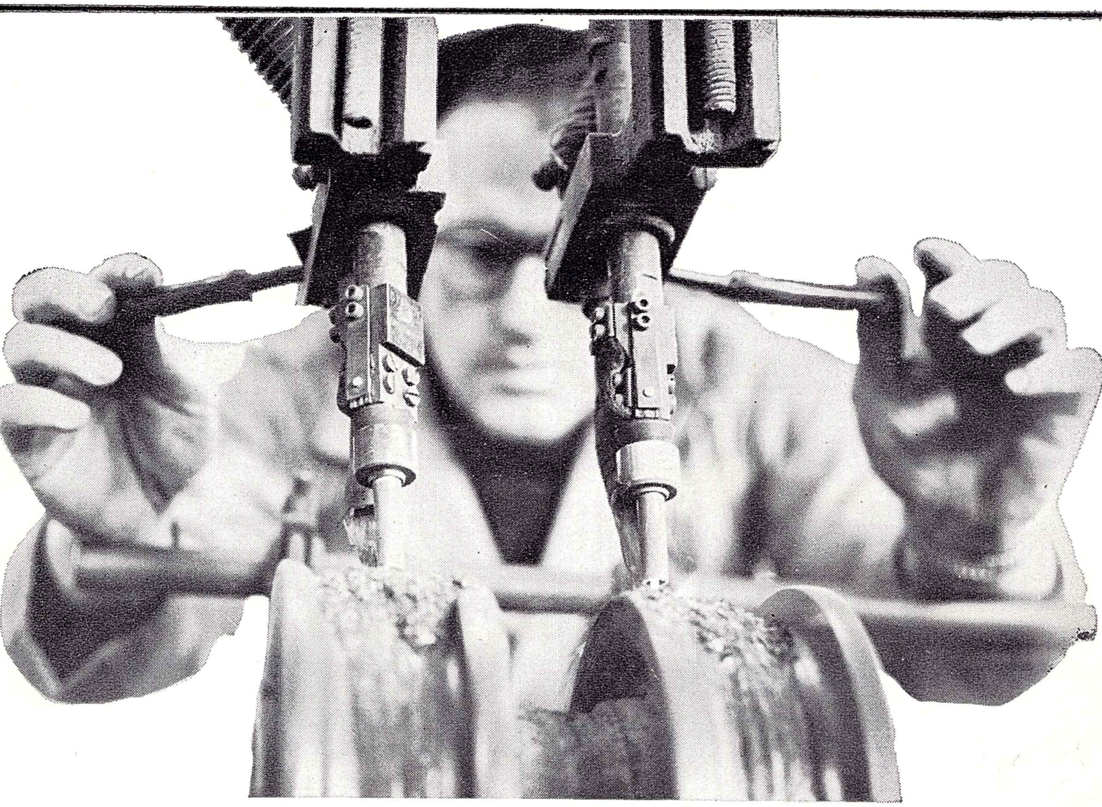
- Reserves, present production and estimated production in 1990
- Total usage of coal by main users, with exports and imports
- Main constraints to increased production
- Published intentions of the industry in the new energy situation
- Estimated capital and operating costs, operating costs per barrel of oil equivalent
- Names and addresses of the main mining companies and of mining associations or ministries involved
- Brief outline of the mining methods and equipment used.

Part II deals with the major sources of export coal throughout the world, total world export trade in 1972 (the last year for which complete data is available) by exporting country is tabulated and an estimate is given of the availability of export coal in the main exporting countries for 1990. The international system of coal classification is described and specific classifications used in the U.S.A., Canada, Australia, the United Kingdom and Poland are given.

For the major exporting countries covered information given includes:

- Qualities of coal available for export
- Destination of exports
- Current pithead of f.o.b. prices (except Poland and South Africa)
- Addresses of main agents and producers of export coal and the main characteristics of the seaports used for coal shipment
- General conditions of sale and provisions for price escalation.

150 pages international A4 $8\frac{1}{4}$" x $11\frac{5}{8}$", price £105 (U.K. only) or £108 ($260) outside the U.K. including airmail postage — Miller Freeman Publications Ltd, Circle House North, 69/71 Wembley Hill Road, Wembley, Middlesex HA9 8BL, England.



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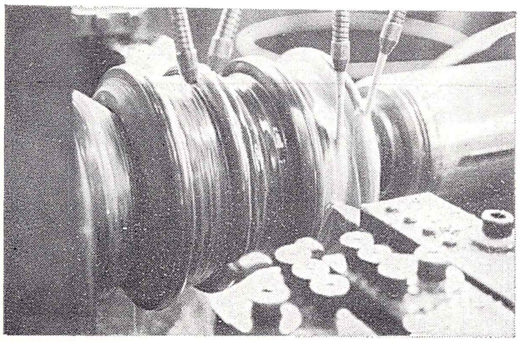

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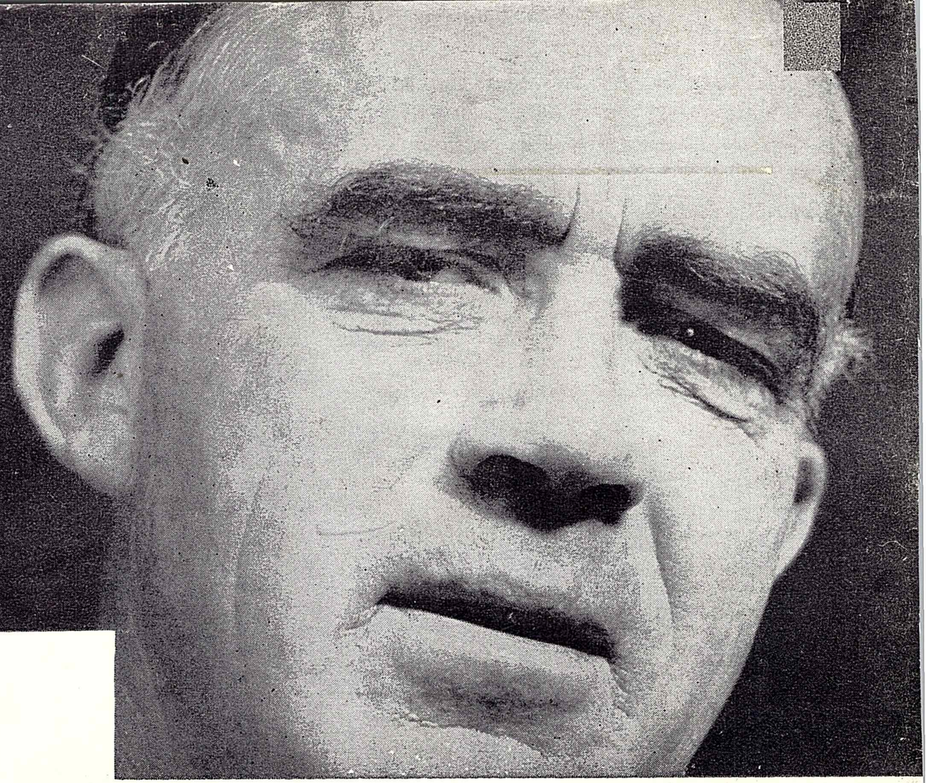

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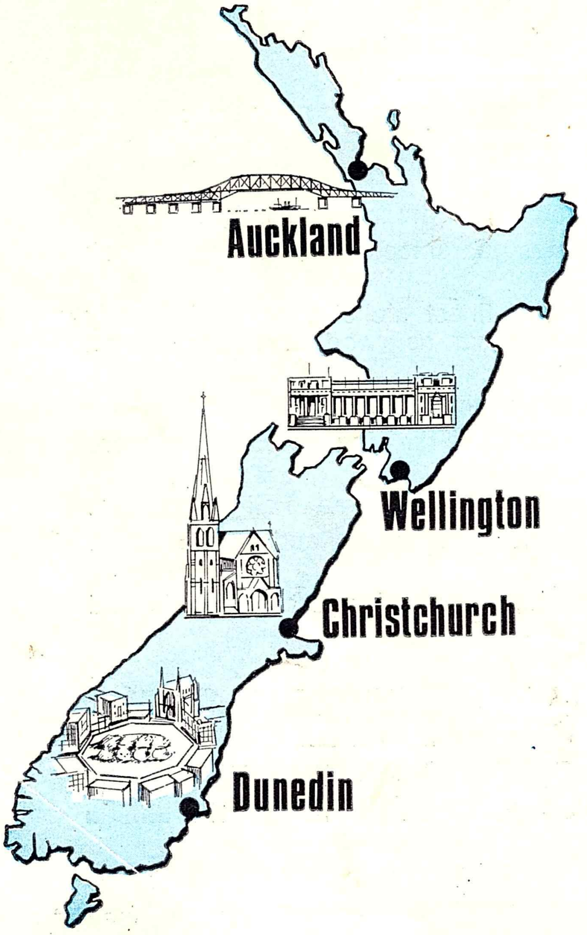

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